Sanitation
in meat production

Prof Ockerman 1960's 2X2 slides originally constructed in the 60's

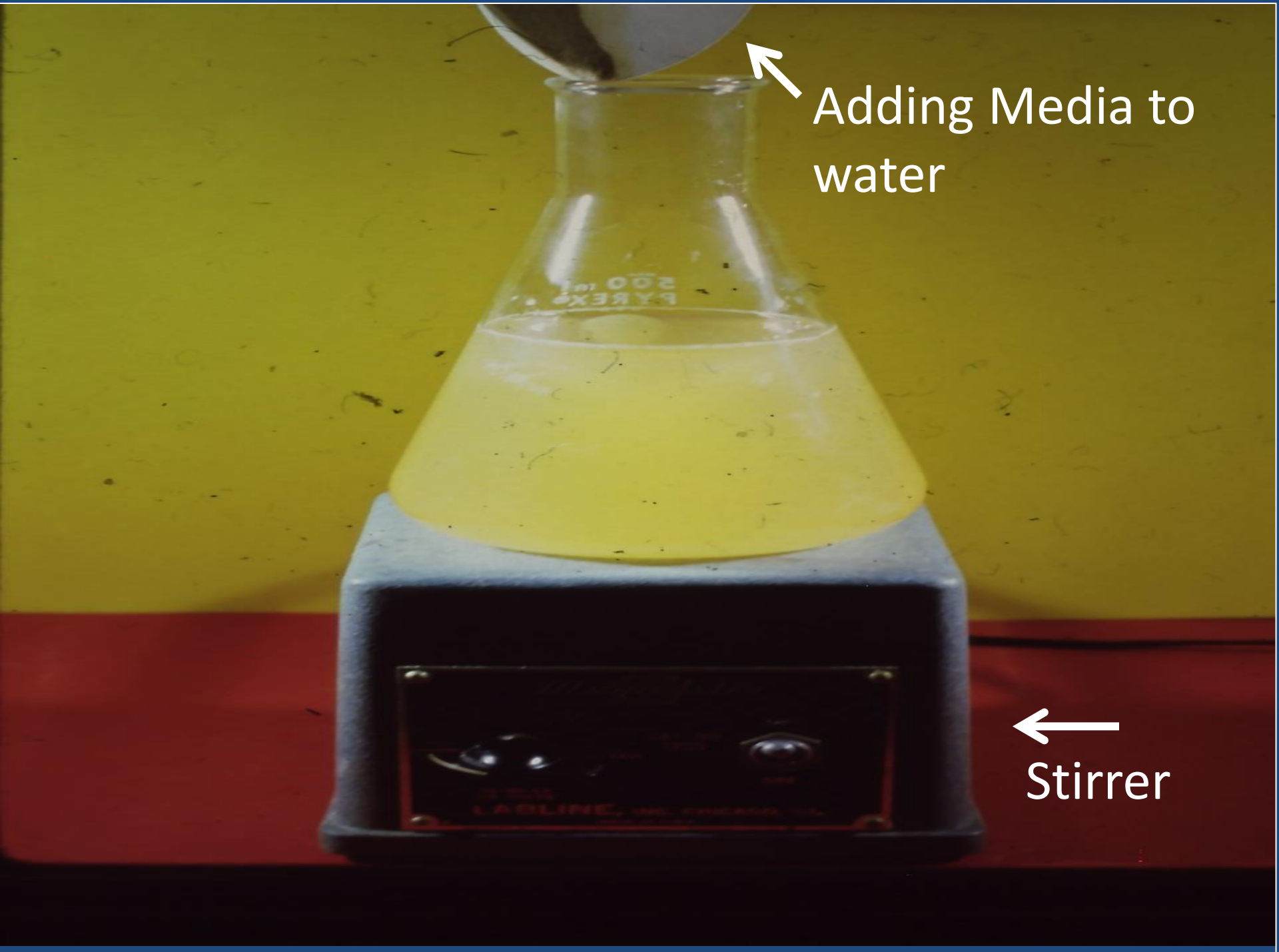
Some of script was added in 2015

The Ohio State University

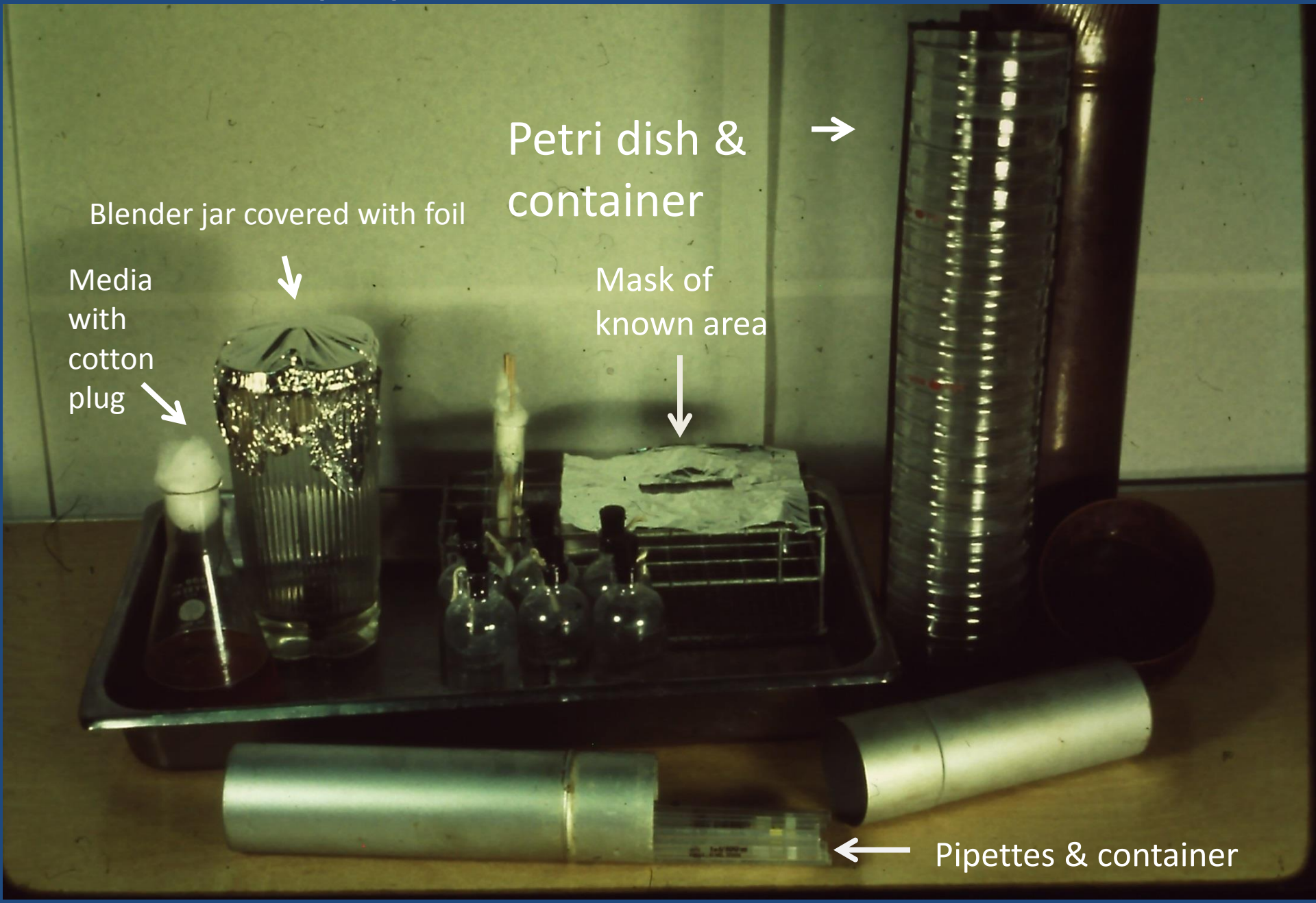
To evaluate sanitation and to see if progress of reducing contamination is effective counting of microorganisms become necessary

A. Preparation of media and equipment


Weighing Media


Adding Media to water
Stirrer

Micro Equipment

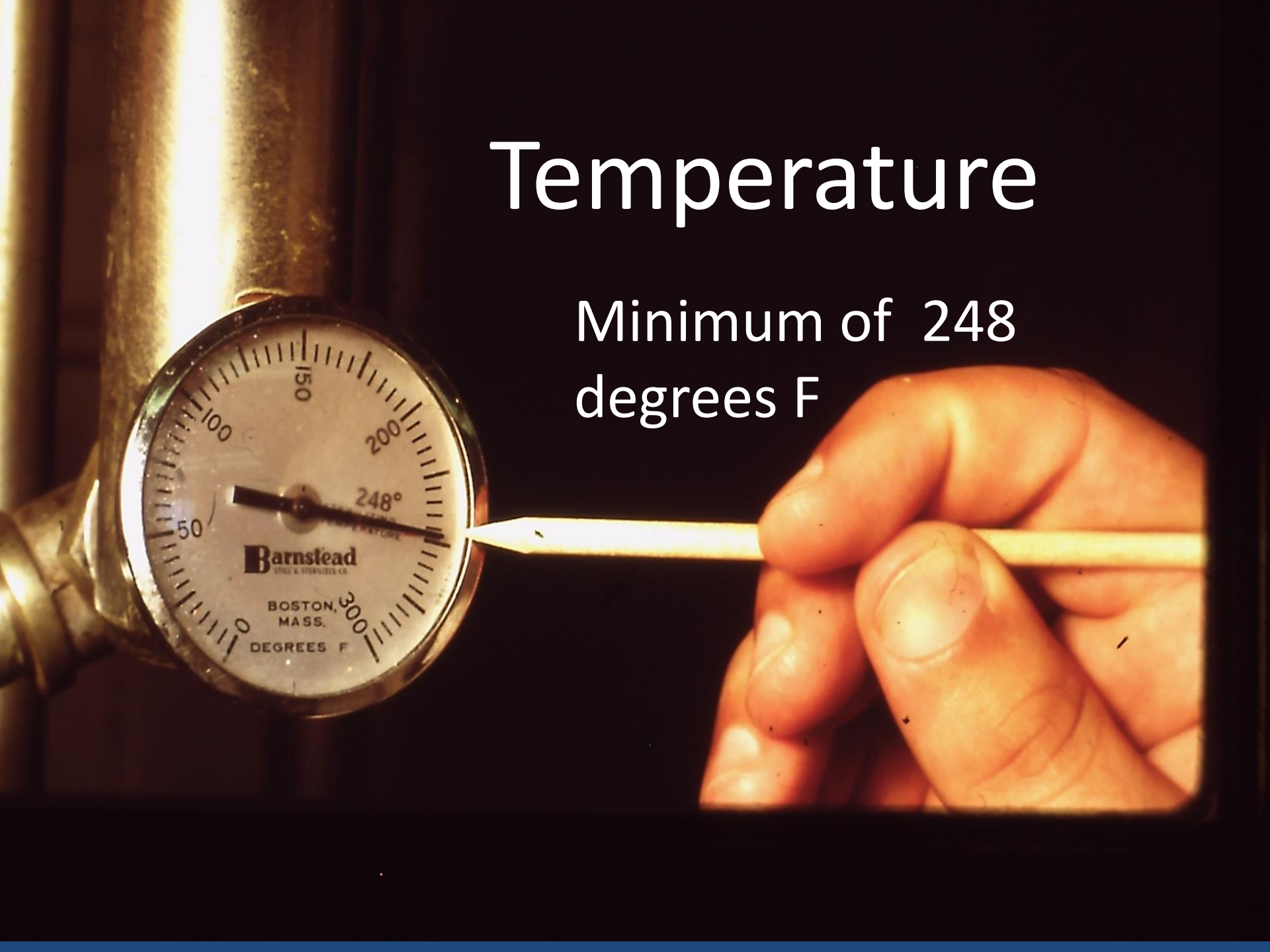



Placing equipment and
media in a pressure
autoclave for
sterilization


0
5
10
15
10
20
20
25
30
30
COMPOUND
INTERNAL
Minimum of
15 psi

Temperature

Minimum of 248 degrees F




MINIMUM 15 MINUTES

Removing sterilized equipment and media from autoclave

B. SAMPLING METHODS

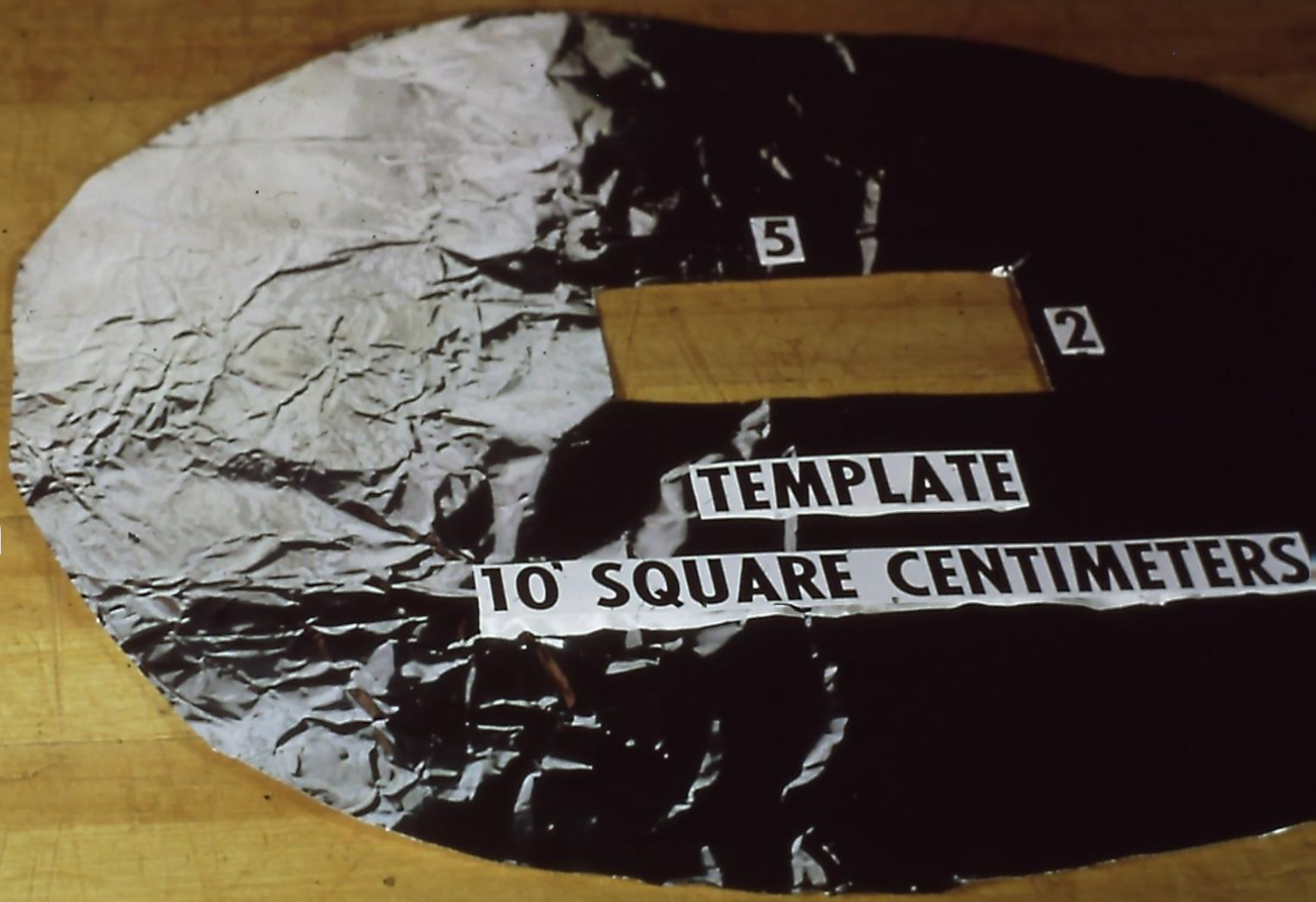
1. Surface Sample
2. Solid Sample
3. Liquid Sample
4. Air Sample
5. Contact Sample

1

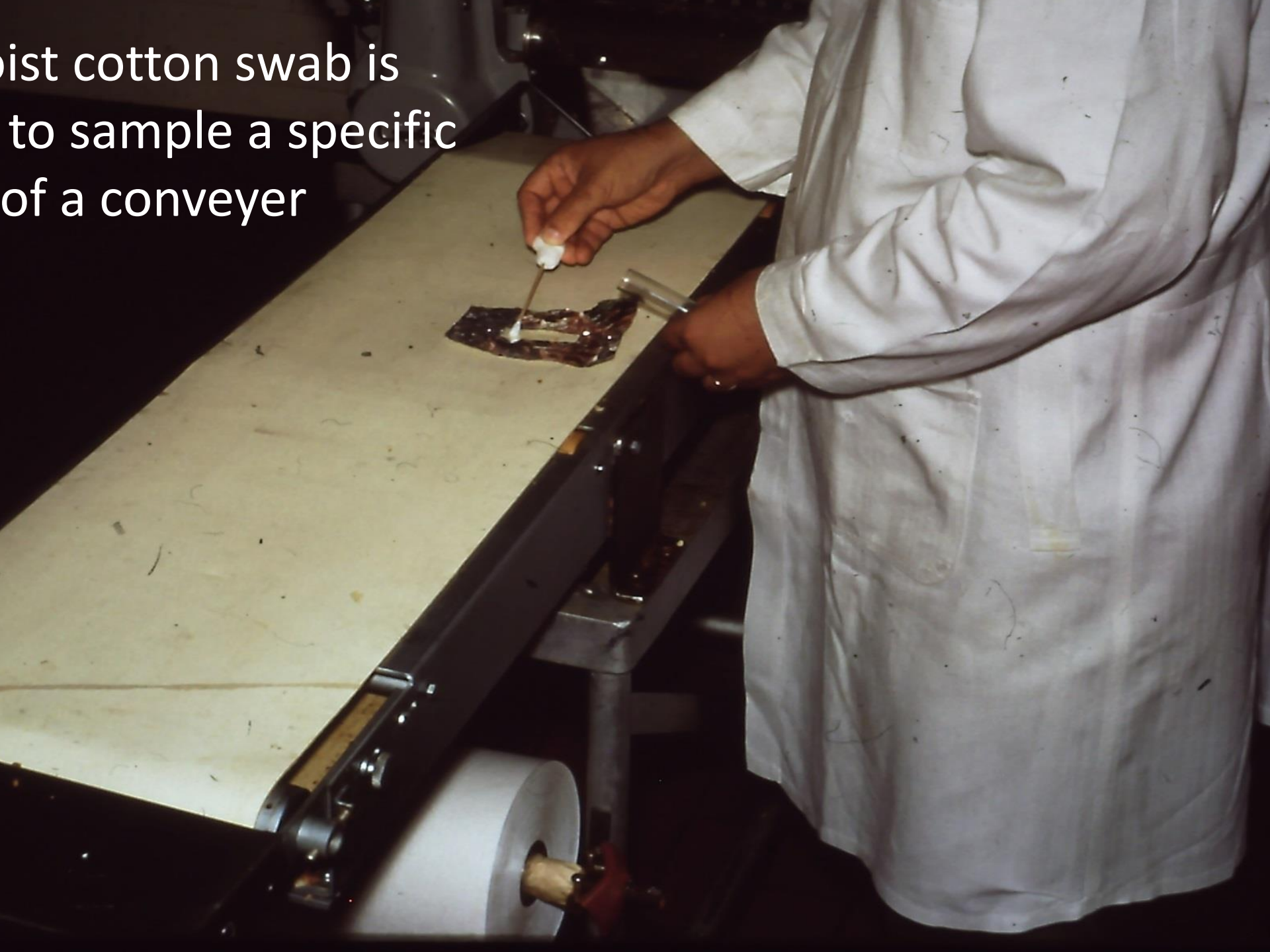
Examples of surface sampling

Sampling a specific area of known dimensions usually hard surfaces

A moist cotton swab is used to collect micro-organisms in the selected area

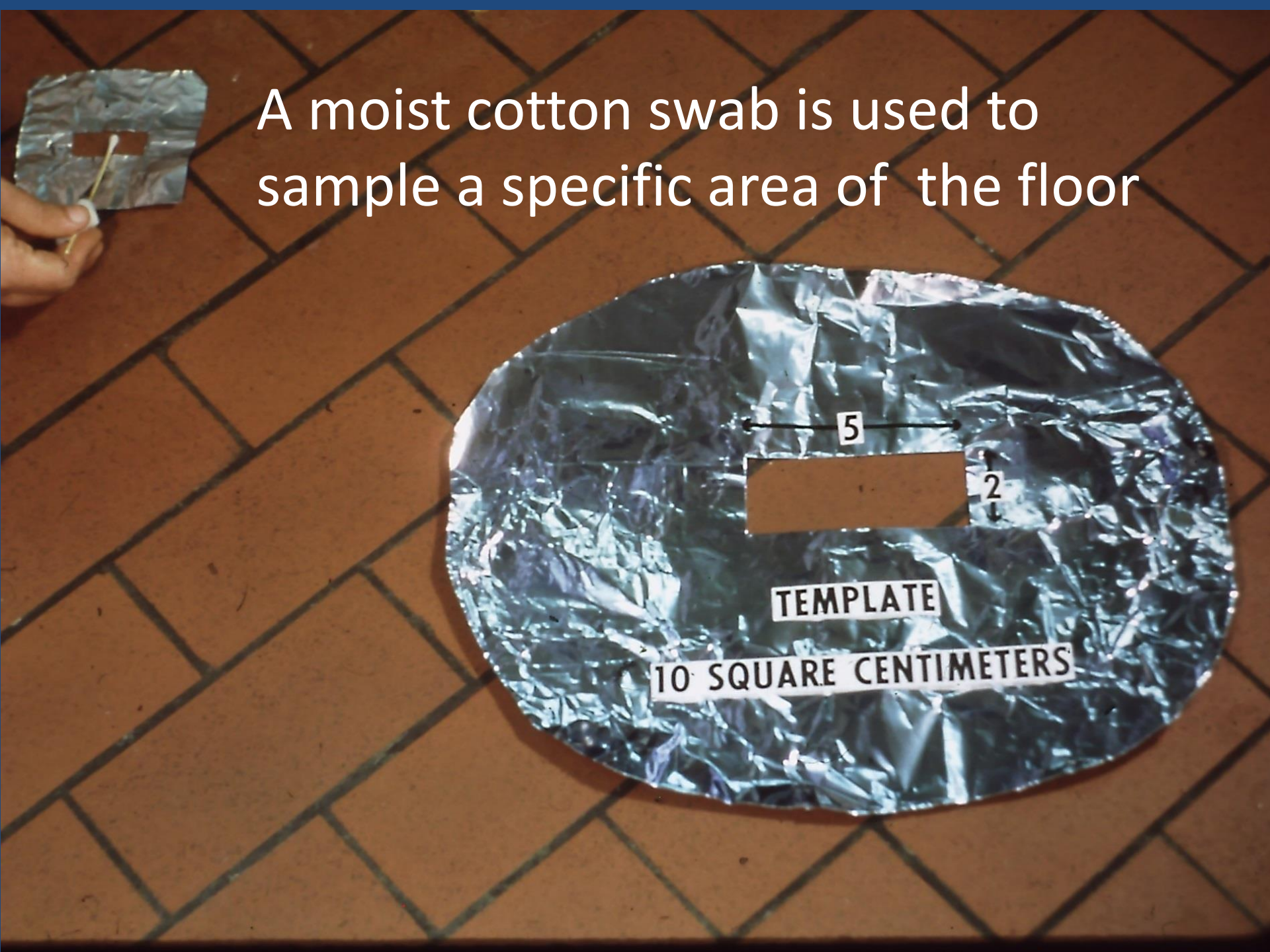


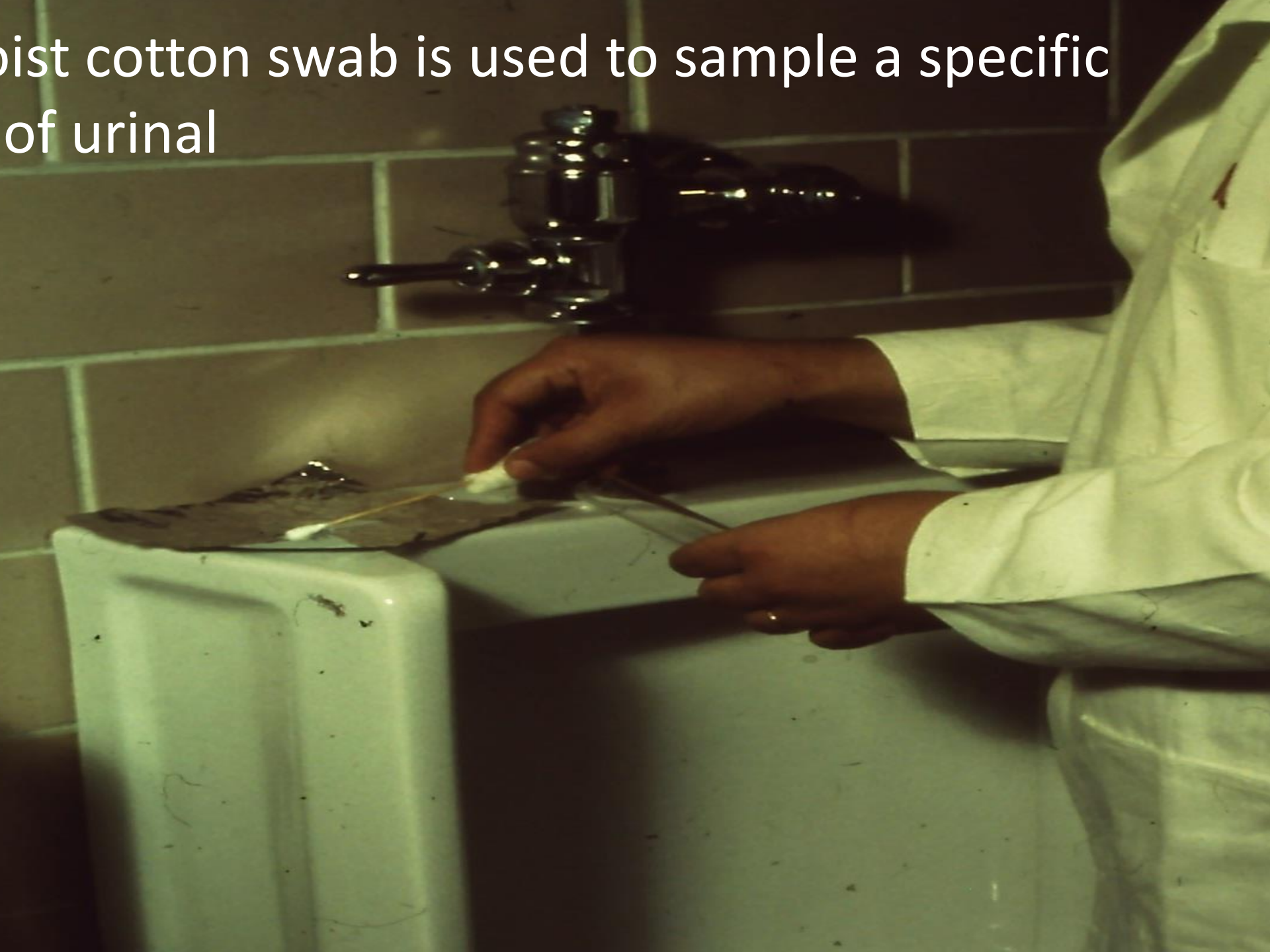

Moist cotton swab
is used sample a specific
known area of a meat tub

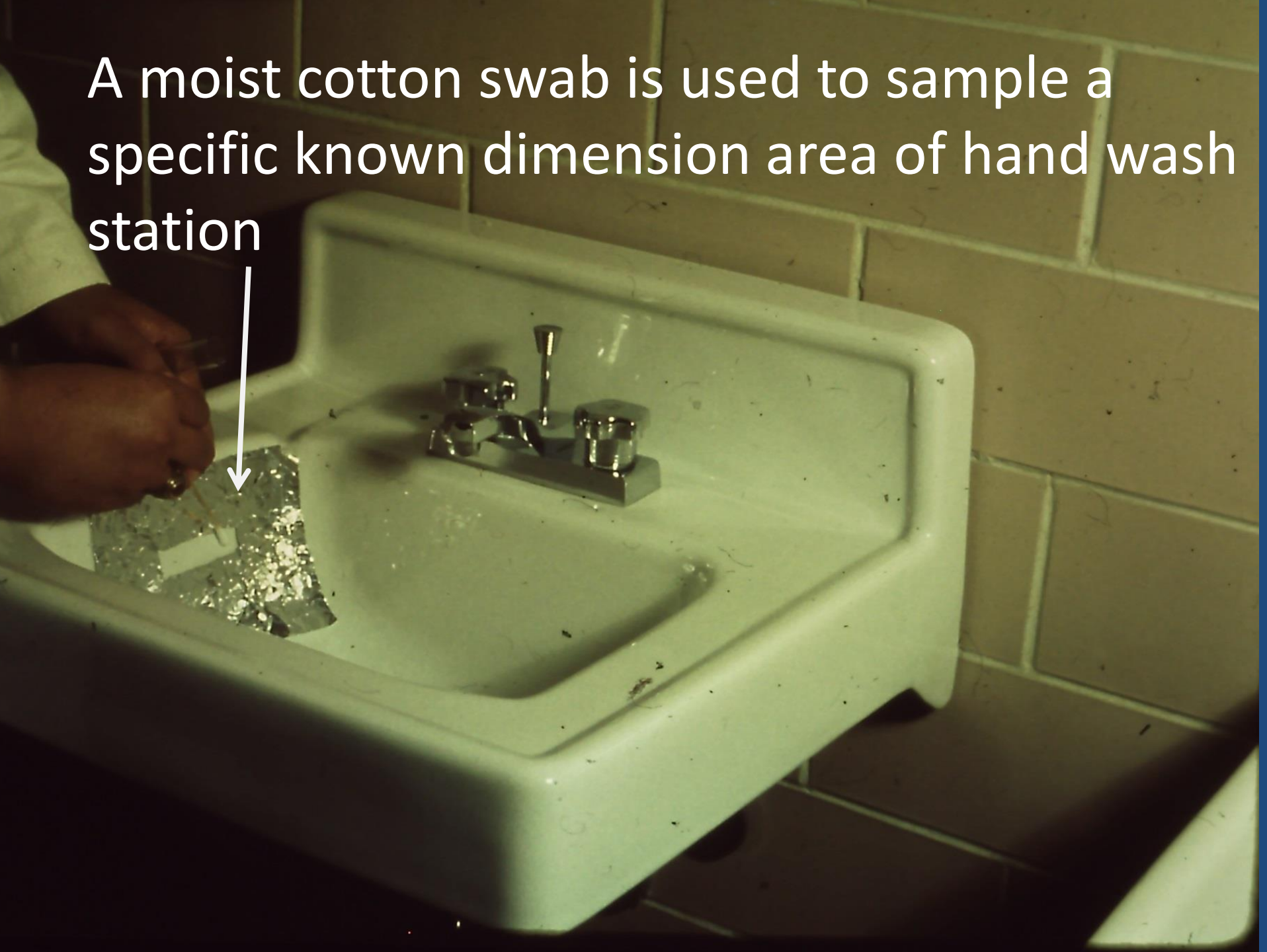

ist cotton swab is
to sample a specific
of a conveyer

A moist cotton swab is used to sample a specific area of a turkey dinner plate

A moist cotton swab is used to sample a specific area of the floor

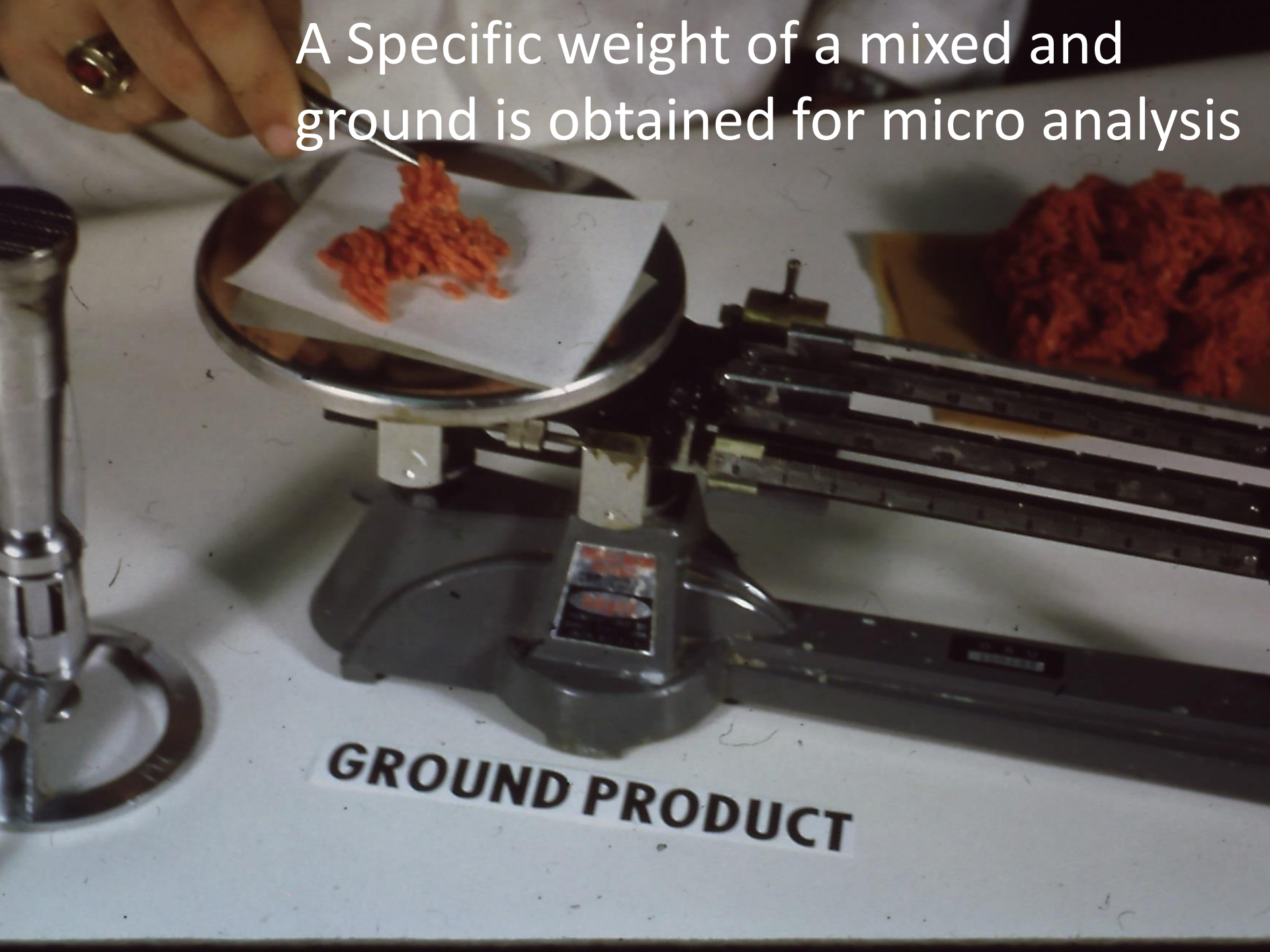


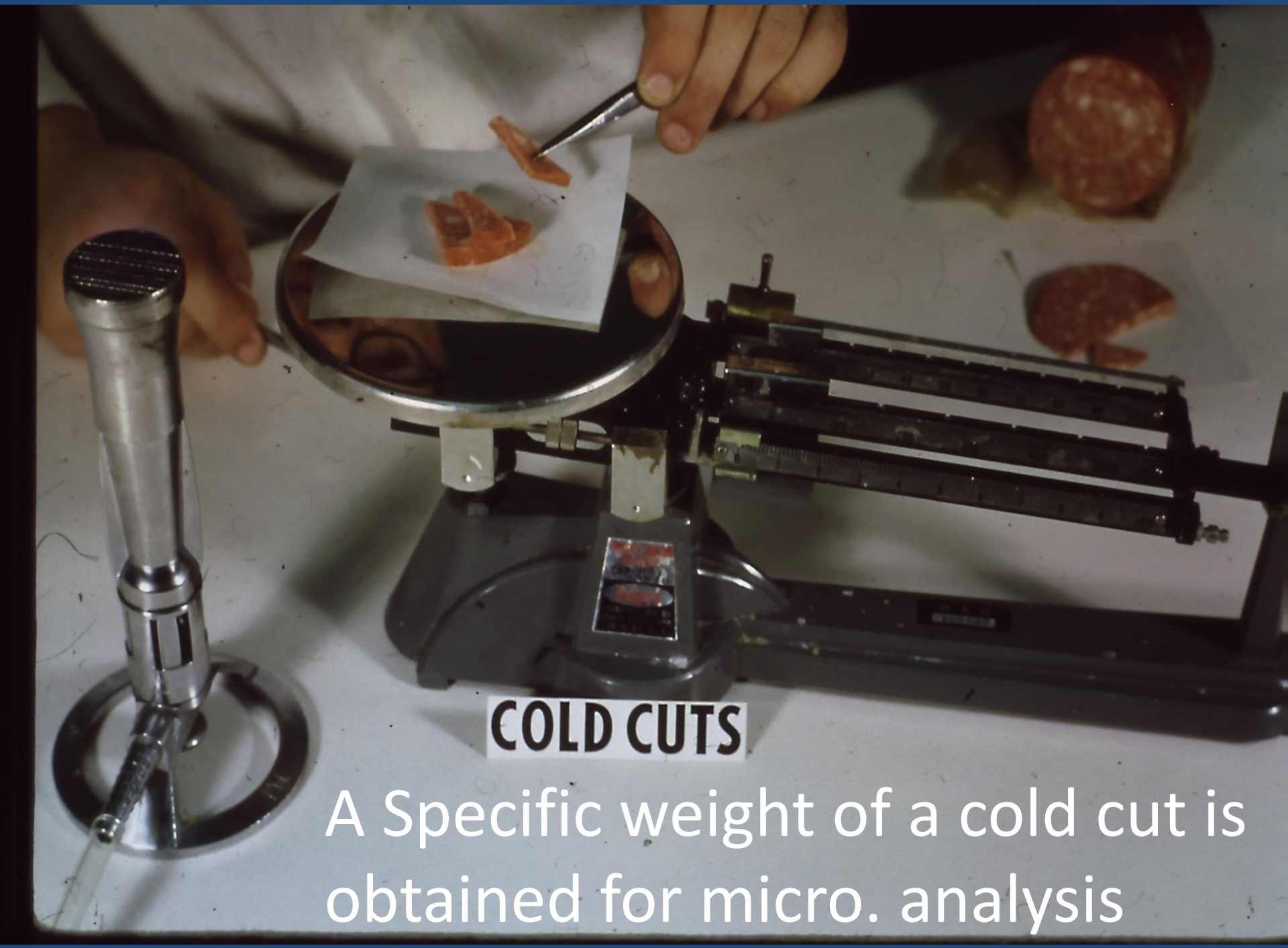

oist cotton swab is used to sample a specific
of urinal


A moist cotton swab is used to sample a specific known dimension area of hand wash station

2

Sampling of a Product

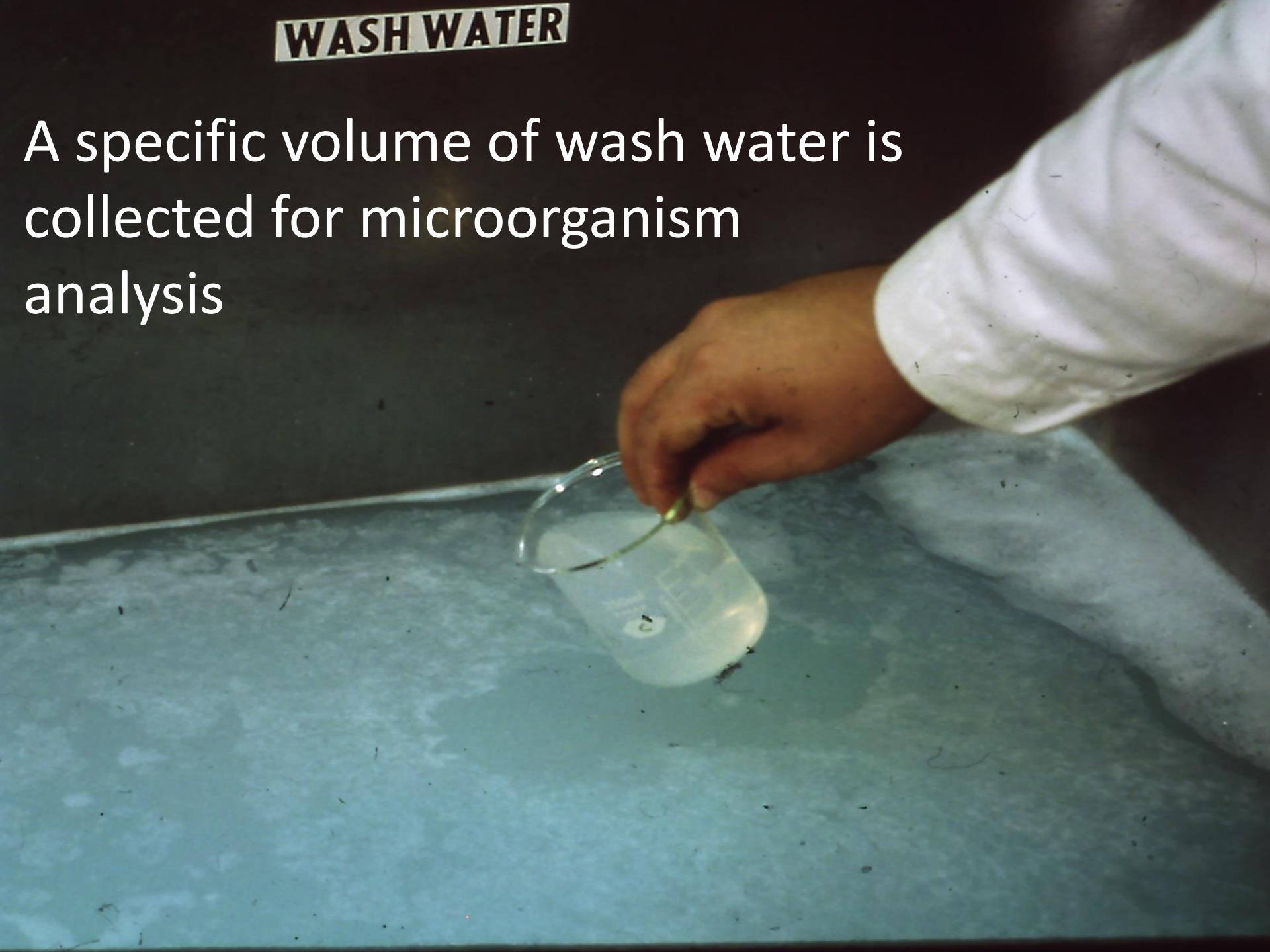

A Specific weight of a mixed and ground is obtained for micro analysis
GROUND PRODUCT



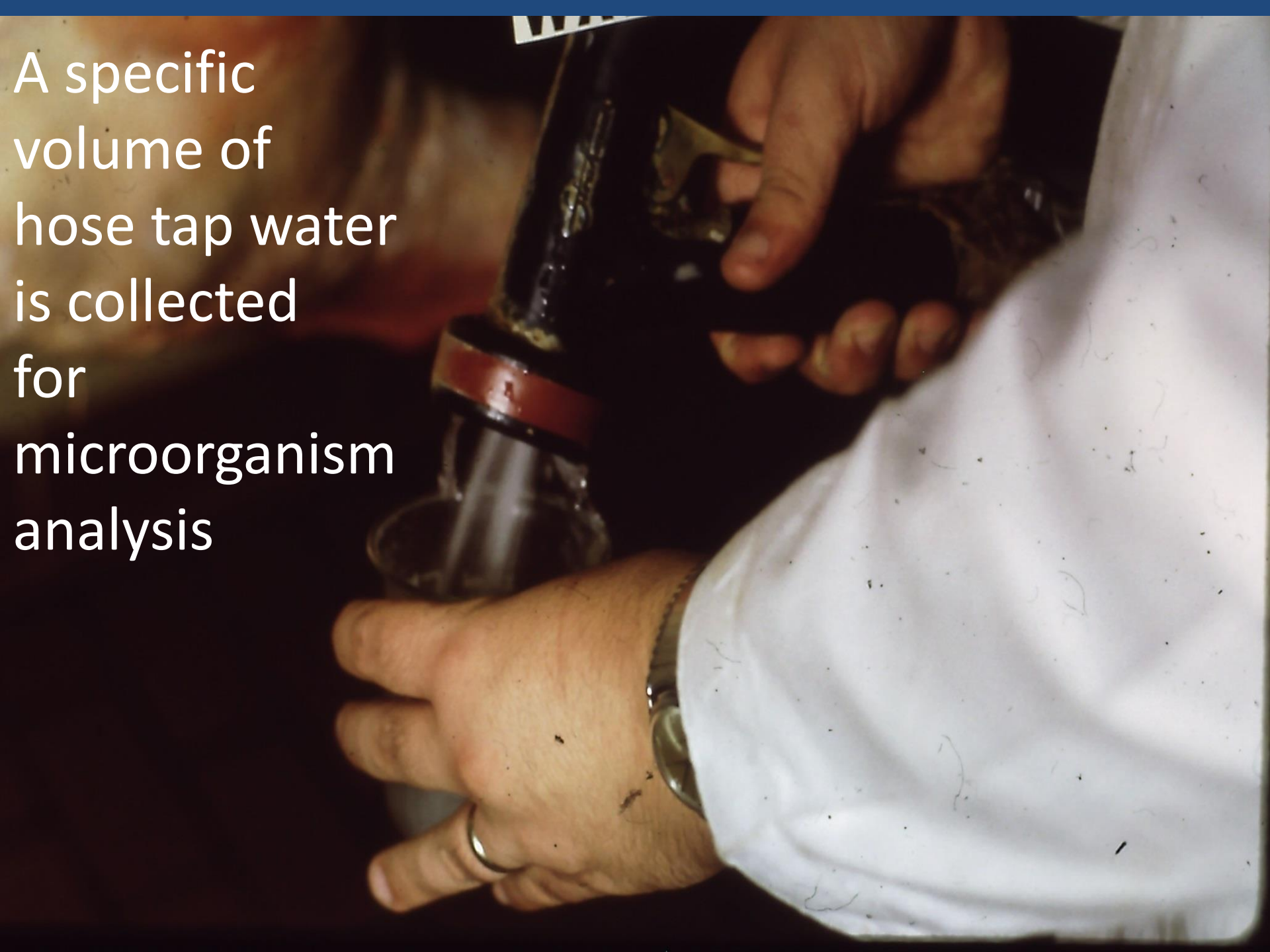
A Specific weight of a cold cut is obtained for micro. analysis

A Specific weight of a solid product is obtained for micro analysis

3
Examples of liquid sampling



A specific volume of wash water is collected for microorganism analysis


A specific volume of hose tap water is collected for microorganism analysis


specific volume of hog scald tank water
is collected for microorganism analysis
SCALD TANK WATER

4
Examples or air sampling

Air Sample is collected from an open widow with a open petri dish containing micro. Agar. Time of exposure needs to be obtained

x

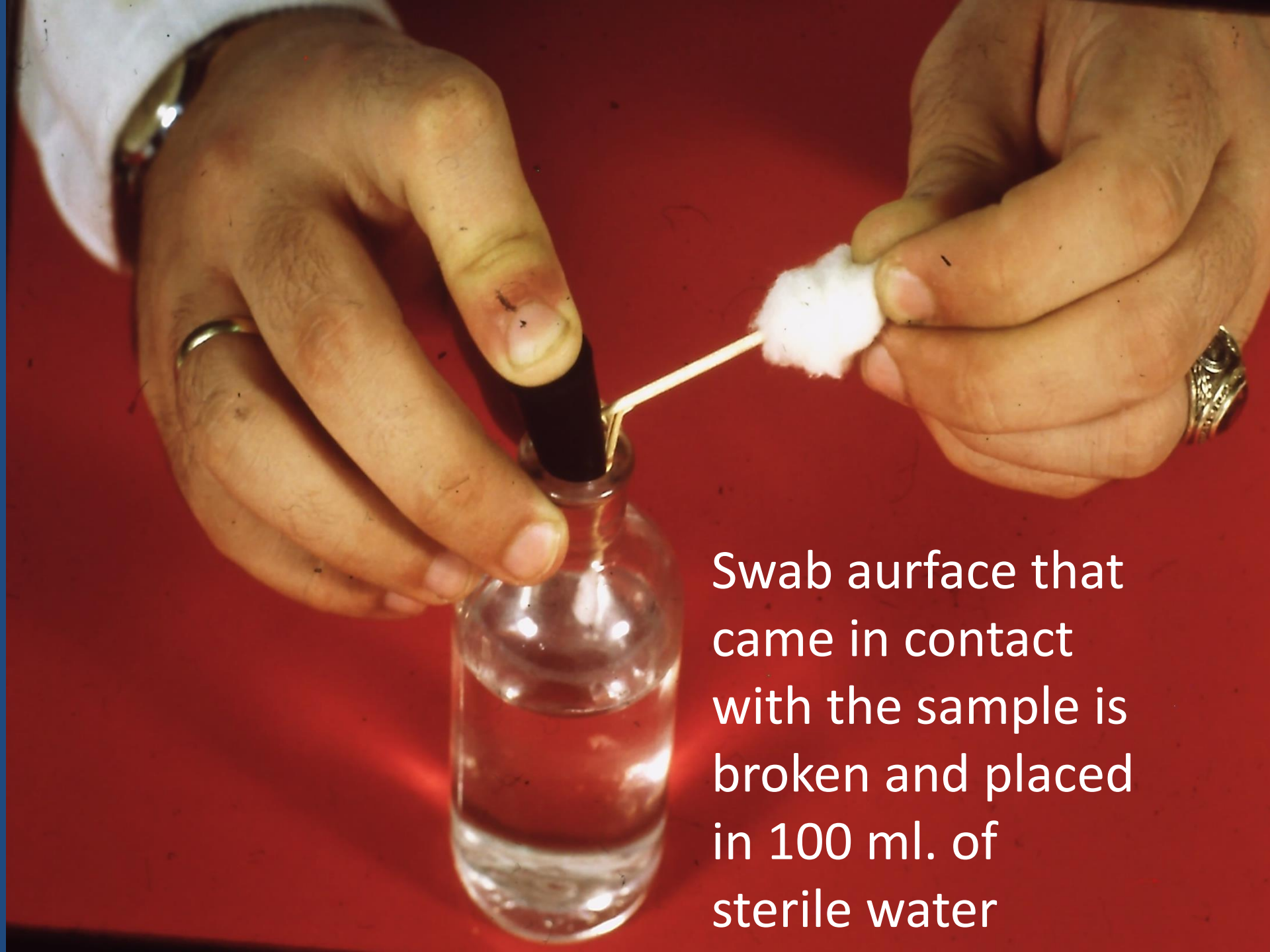
Air Sample is collected from an air vent with a open petri dish containing micro. Agar. Time of exposure needs to be obtained


HOLDING PENS
Air Sample collected from an holding pen with a open petri dish containing micro. Agar

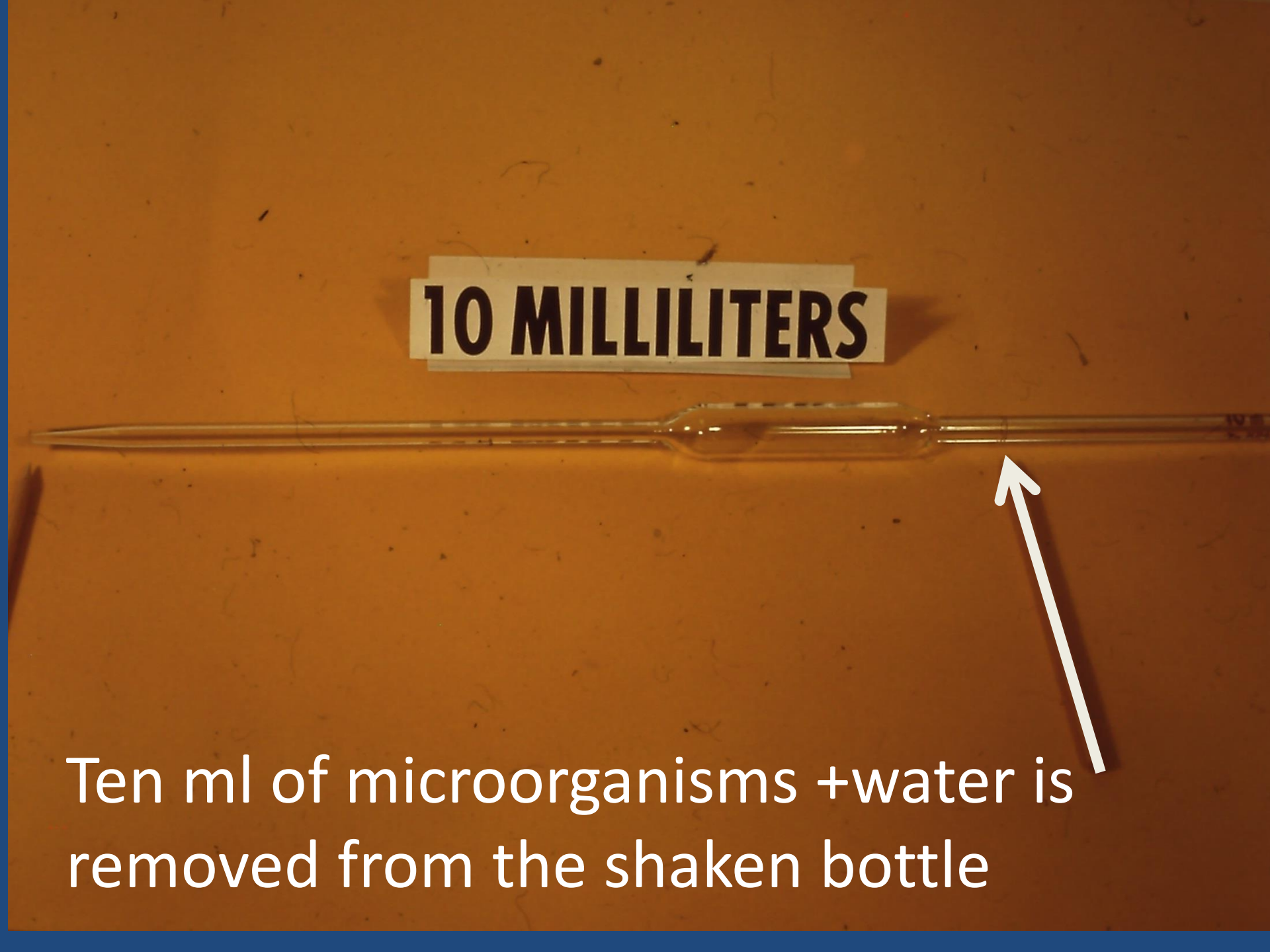
5
Examples of contact sampling

Contact analysis with finger
on agar in petri dish

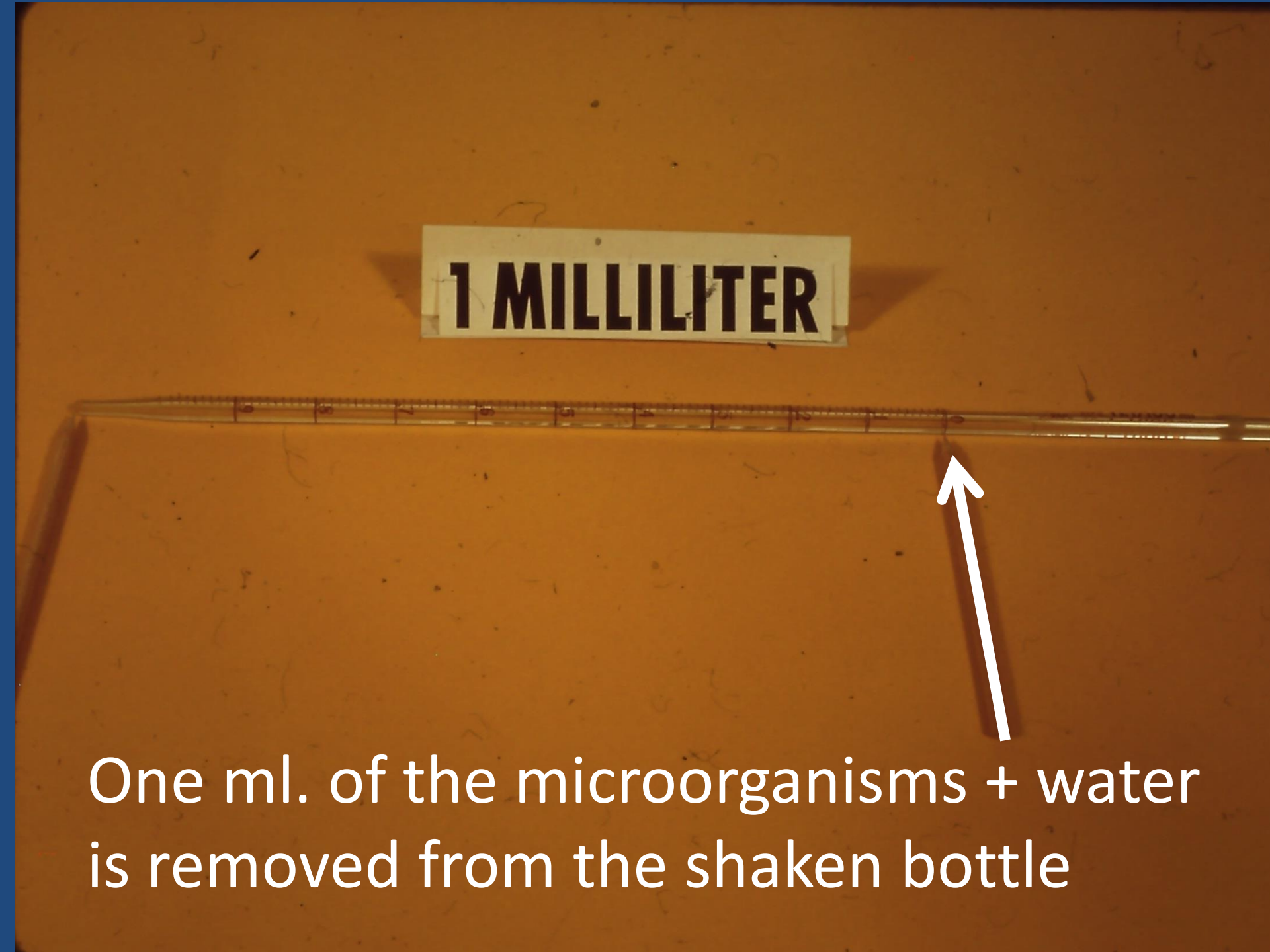
C. Plating techniques


Swab aurface that
came in contact
with the sample is
broken and placed
in 100 ml. of
sterile water

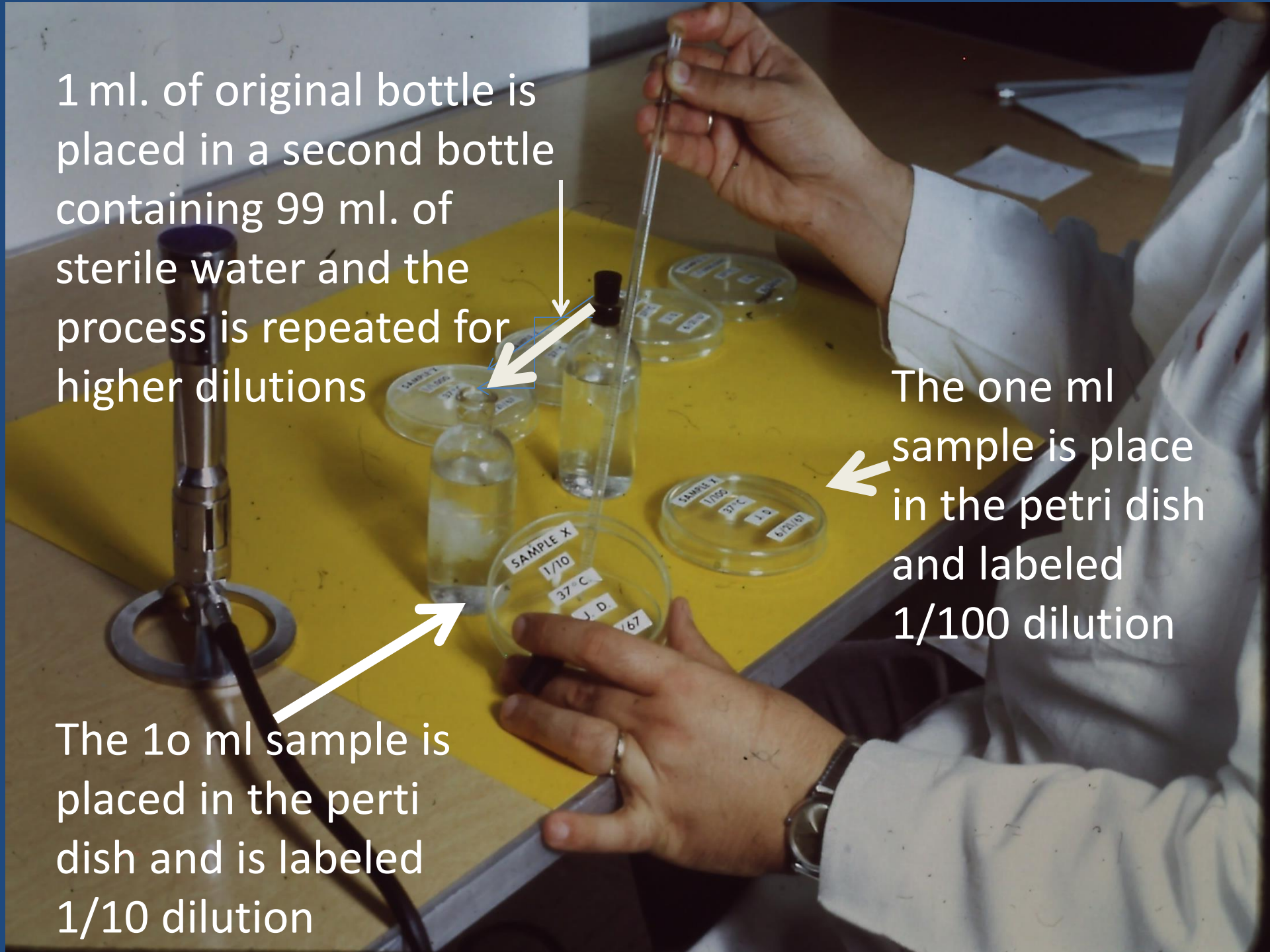
The container is shaken to distribute the microorganisms int the 100 ml. of water

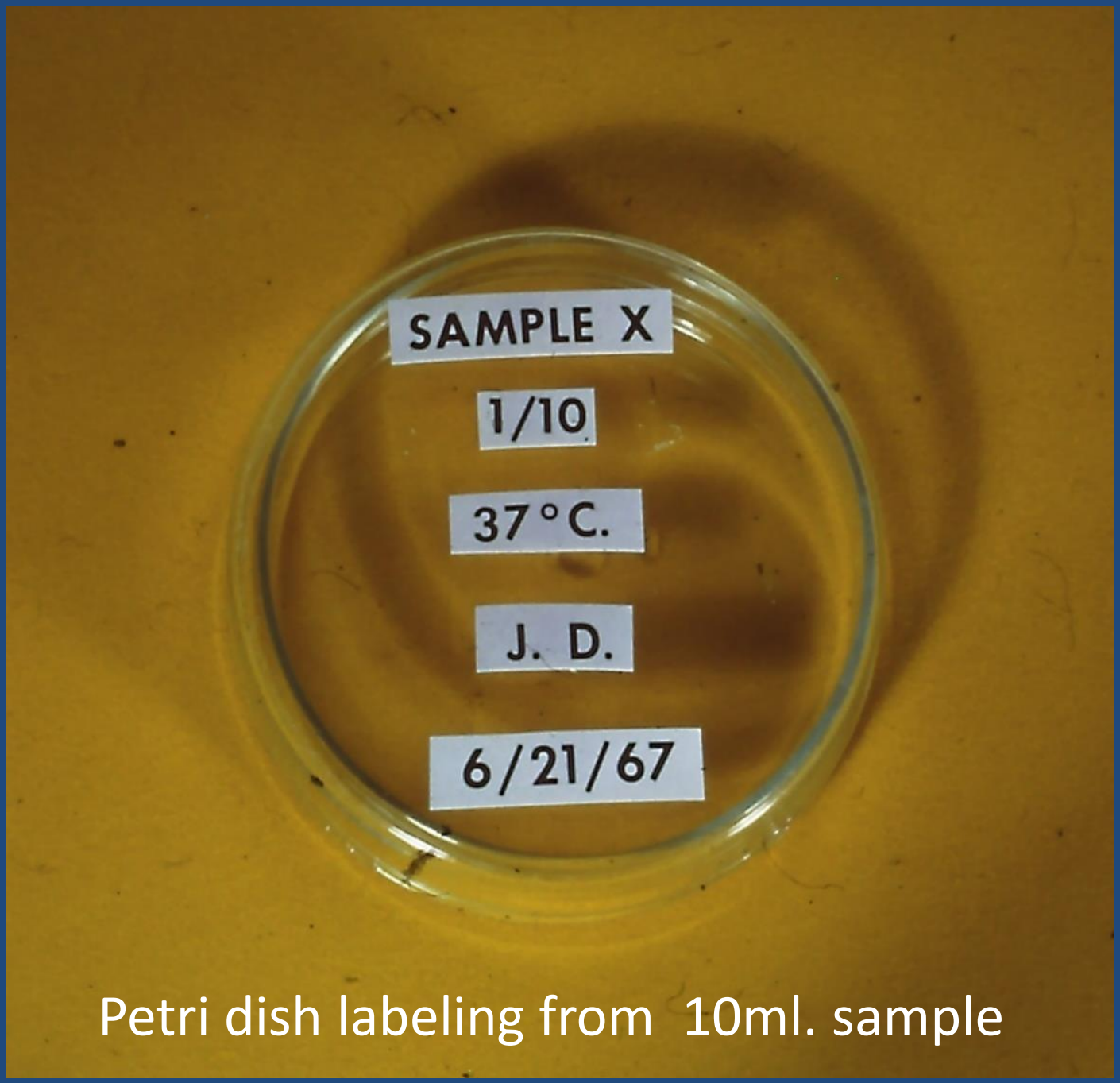


Ten ml of microorganisms +water is removed from the shaken bottle

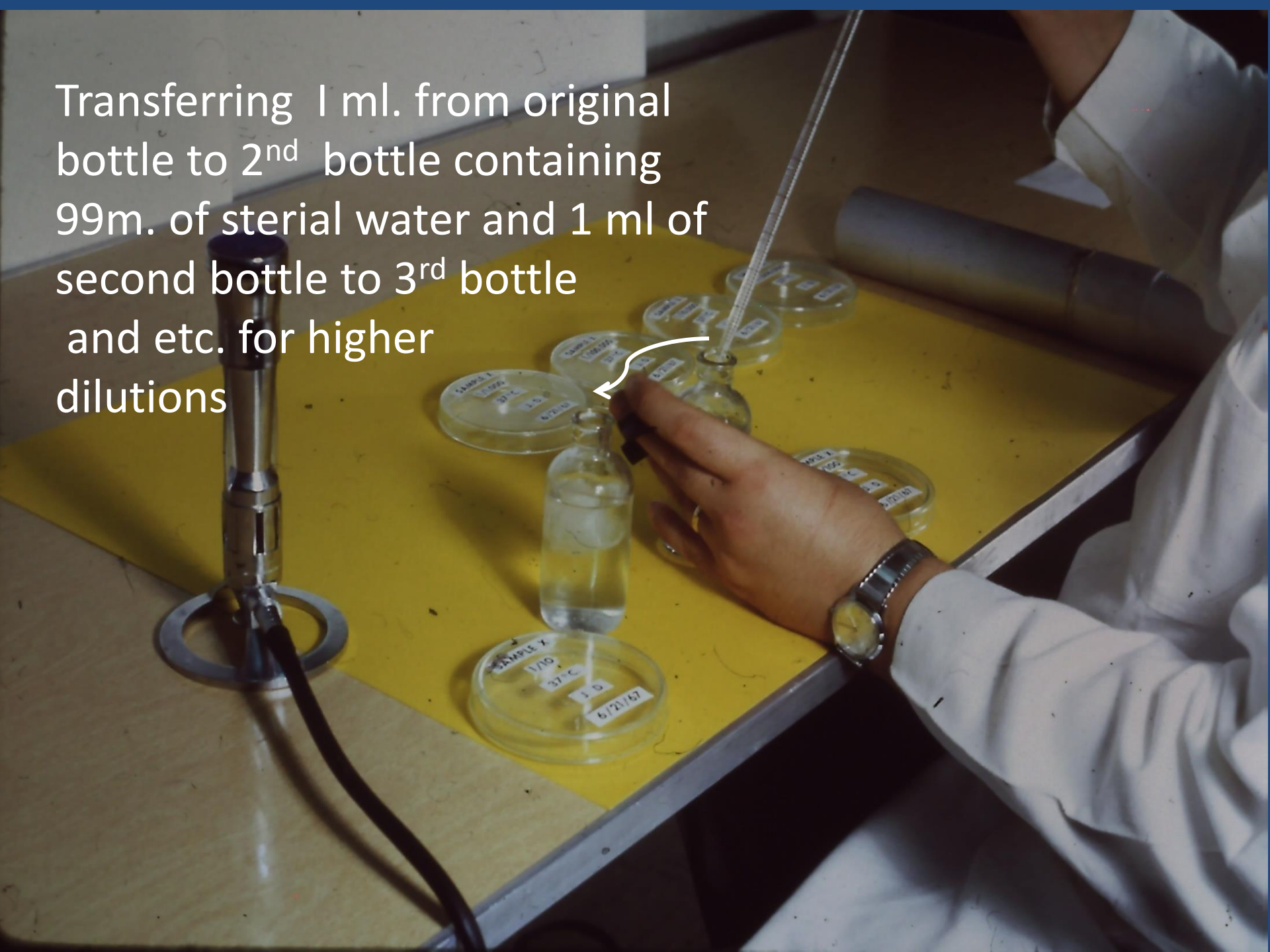


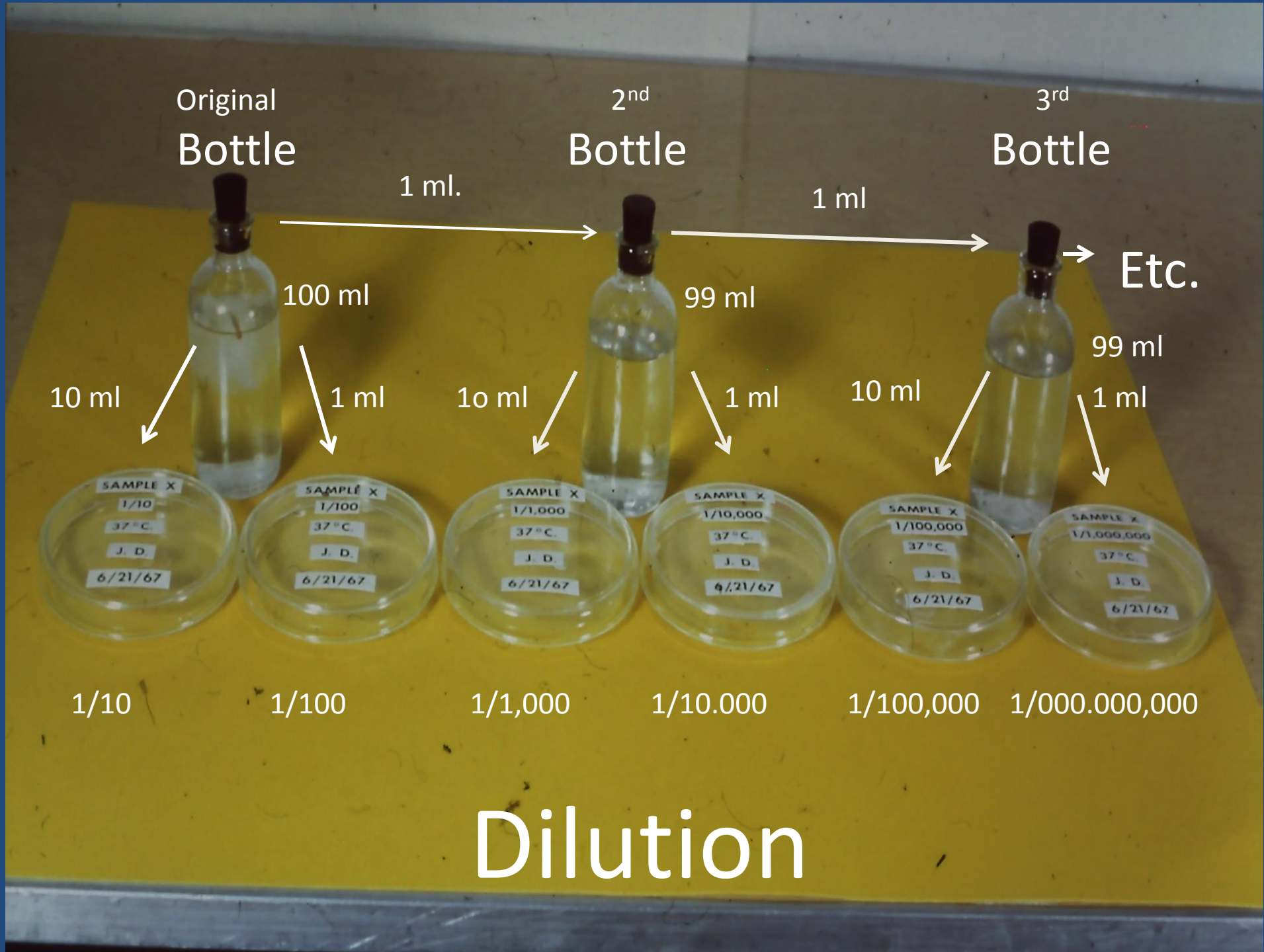
One ml. of the microorganisms + water is removed from the shaken bottle


1 ml. of original bottle is placed in a second bottle containing 99 ml. of sterile water and the process is repeated for higher dilutions
The one ml sample is place in the petri dish and labeled 1/100 dilution
The 1o ml sample is placed in the perti dish and is labeled 1/10 dilution
SAMPLE X
1/10
37° C



Petri dish labeling from 10ml. sample


Transferring I ml. from original bottle to 2nd bottle containing 99m. of sterial water and 1 ml of second bottle to 3rd bottle and etc. for higher dilutions

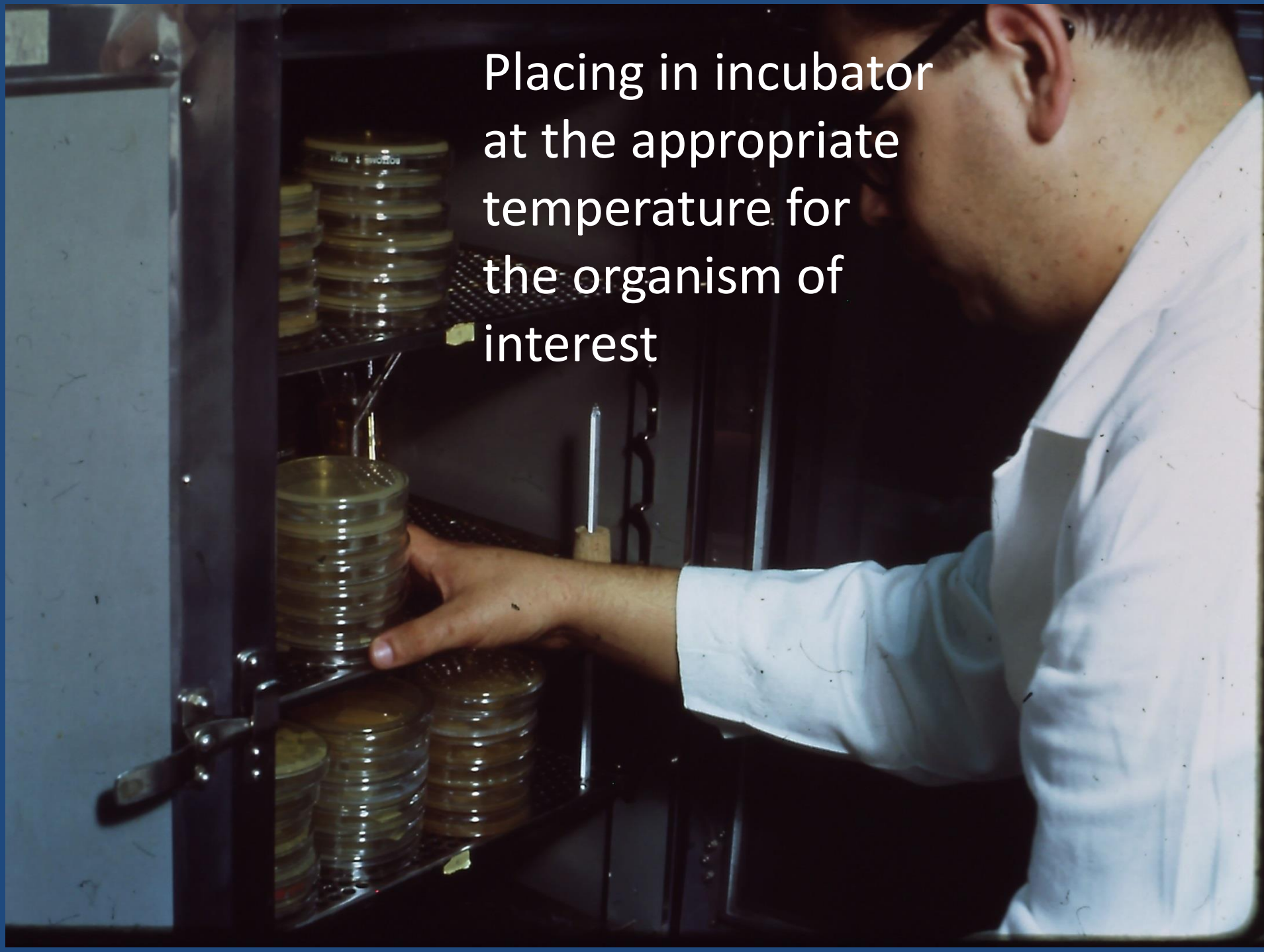

Original
Bottle
2nd
Bottle
3rd
Bottle
1 ml.
1 ml
Etc.
100 ml
99 ml
99 ml
10 ml
1 ml
1o ml
1 ml
10 ml
1 ml
SAMPLE X
1/10
37°C.
J. D.
6/21/67
SAMPLE X
1/100
37°C.
J. D.
6/21/67
SAMPLE X
1/1,000
37°C.
J. D.
6/21/67
SAMPLE X
1/10,000
37°C.
J. D.
6/21/67
SAMPLE X
1/100,000
37°C.
J. D.
6/21/67
SAMPLE X
1/1,000,000
37°C.
J. D.
6/21/67
1/10
1/100
1/1,000
1/10.000
1/100,000
1/000.000,000
Dilution


Adding agar (micro food)
to petri dishes
SAMPLE X
1/10,000
37 °C
J. D.
SAMPLE X
1/10
37°C
J. D.
6/21/67
SAMPLE X
1/100
37°C
J. D.
6/21/67
SAMPLE X
1/1000
37°C
J. D.
6/21/67


Labeling petri dishes
for one sample


Inverting petri dishes to control condensation during incubation
SAMPLE
1/1,000
37°C
J. D.
6/21/67

D. Incubation


Placing in incubator
at the appropriate
temperature for
the organism of
interest

3 days of incubation are often used

Incubate for appropriate time depending on organism and temperature of incubation

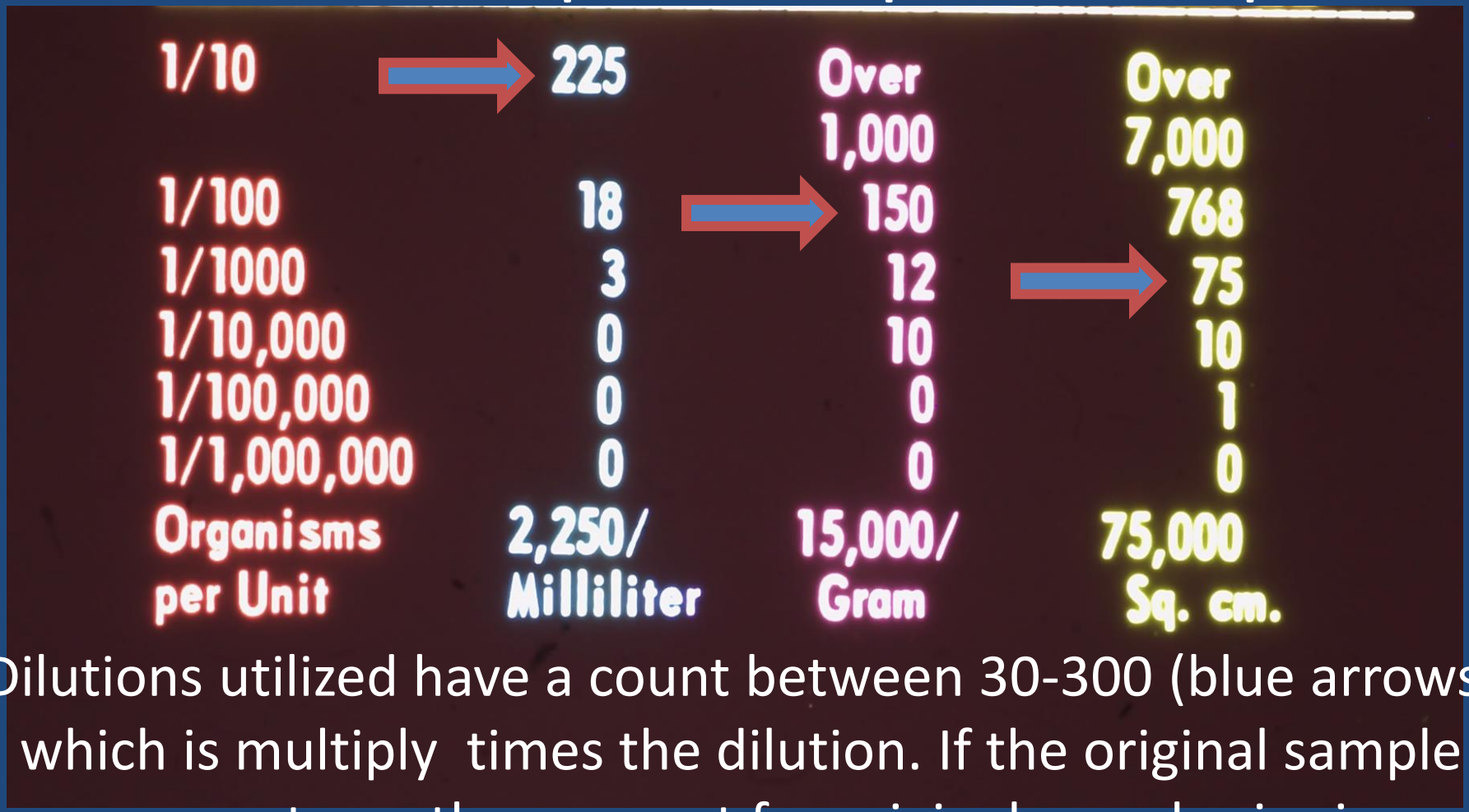

Removal from incubator at appropriate incubation time

E. Colony counting


Each organism has grown into a colony which is now visible and can be counted


Record keeping for count obtained, type of sample, location of product sampled, incubation time and temperature

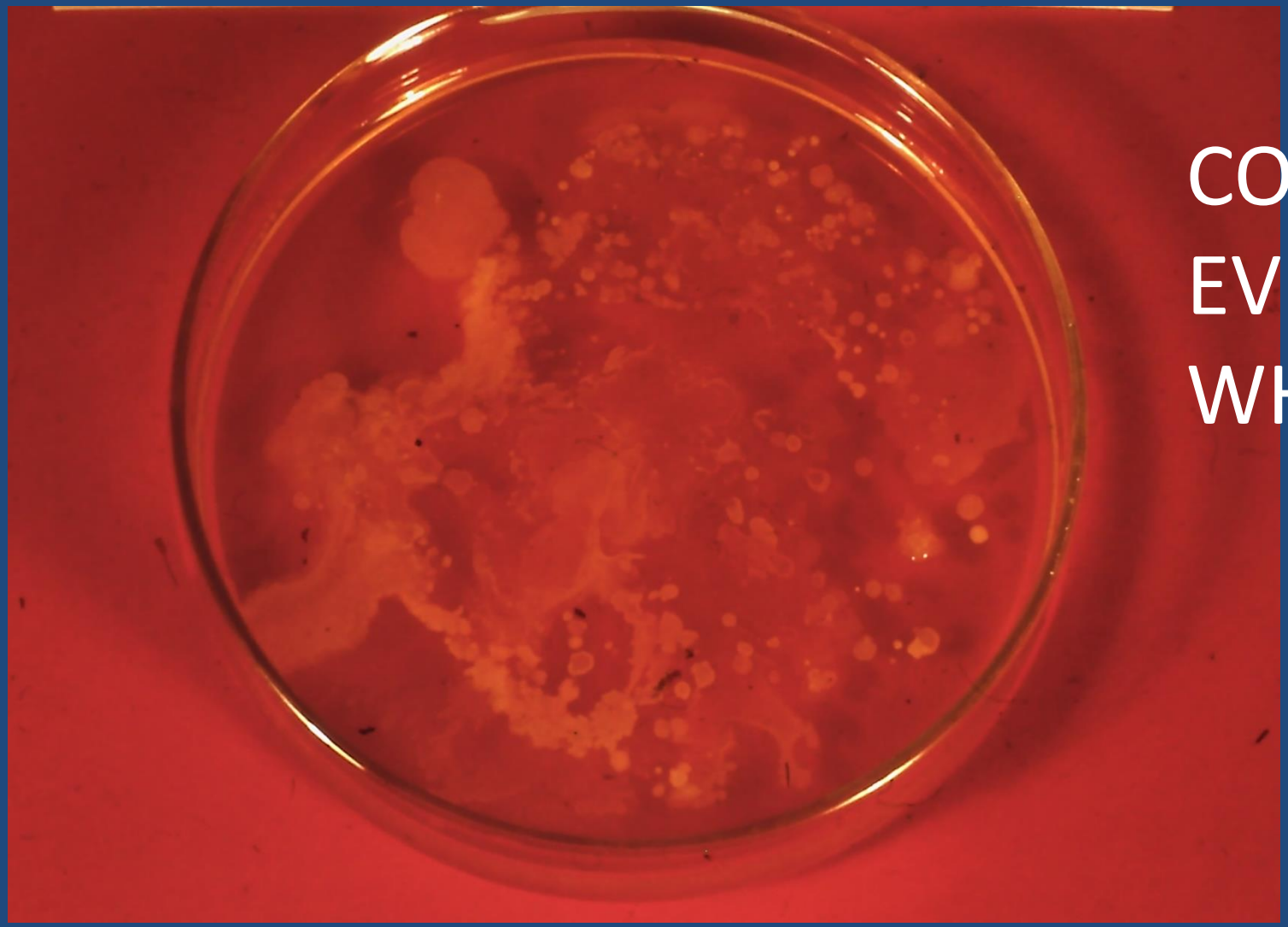
F. Analysis



Dilutions utilized have a count between 30-300 (blue arrows) which is multiply times the dilution. If the original sample was not one then correct for original sample size is necessary


Dirty hands

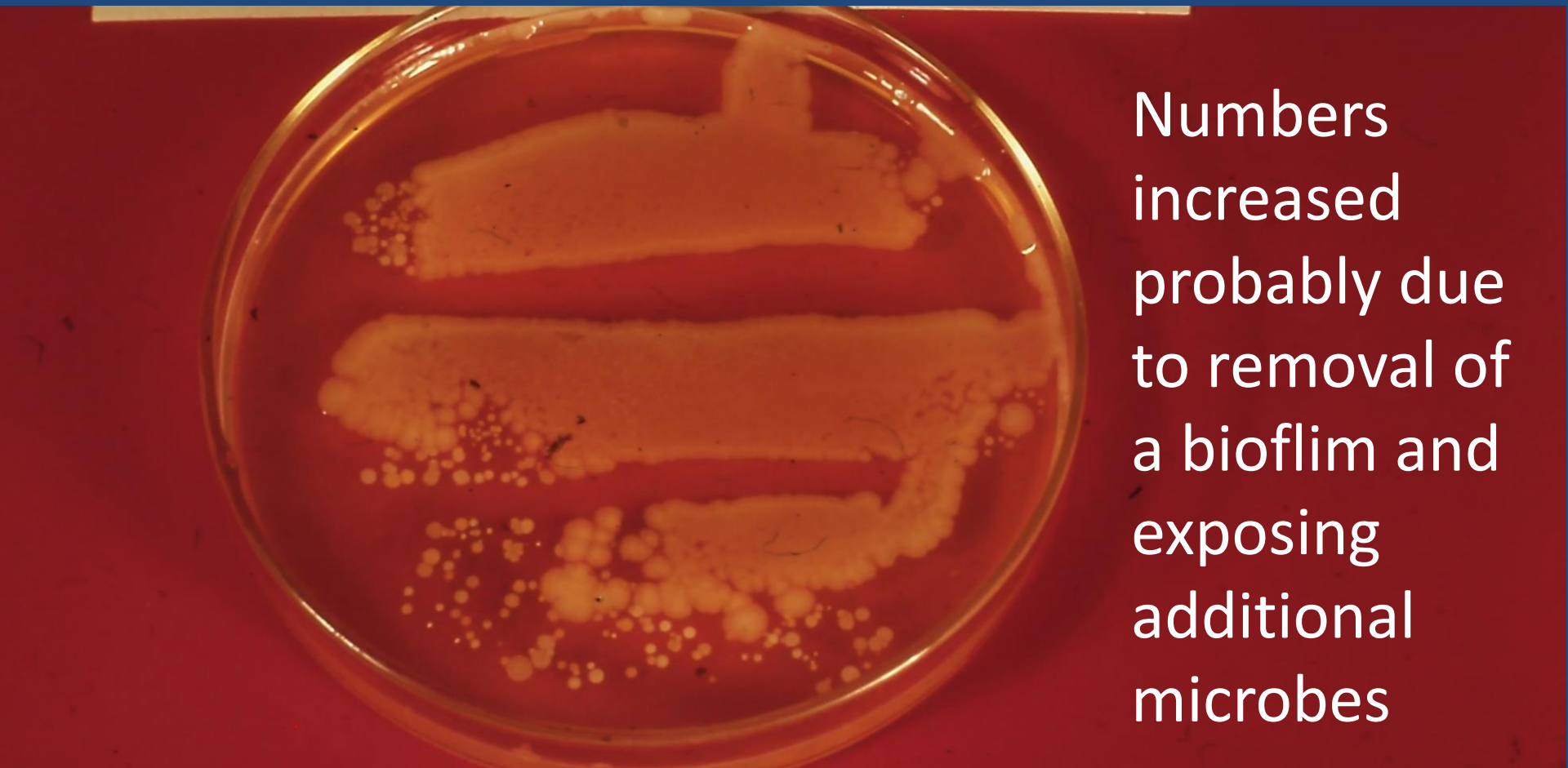
Hands dirty



COLONIES
EVERY
WHERE


Hands rinsed, no
soap

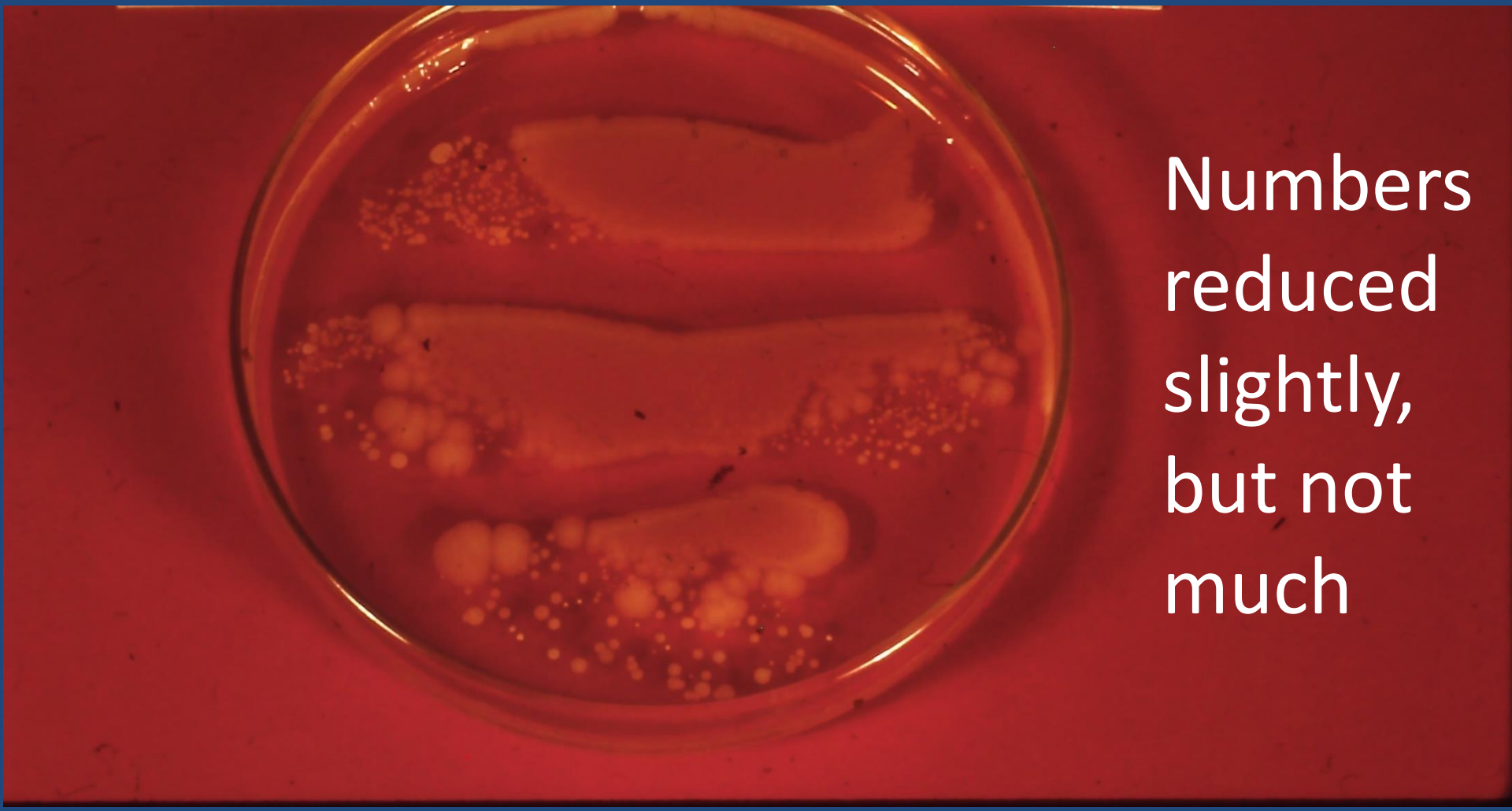
Hands rinsed



Numbers increased probably due to removal of a bioflim and exposing additional microbes


Using a little soap

Hands 1st wash, little soap



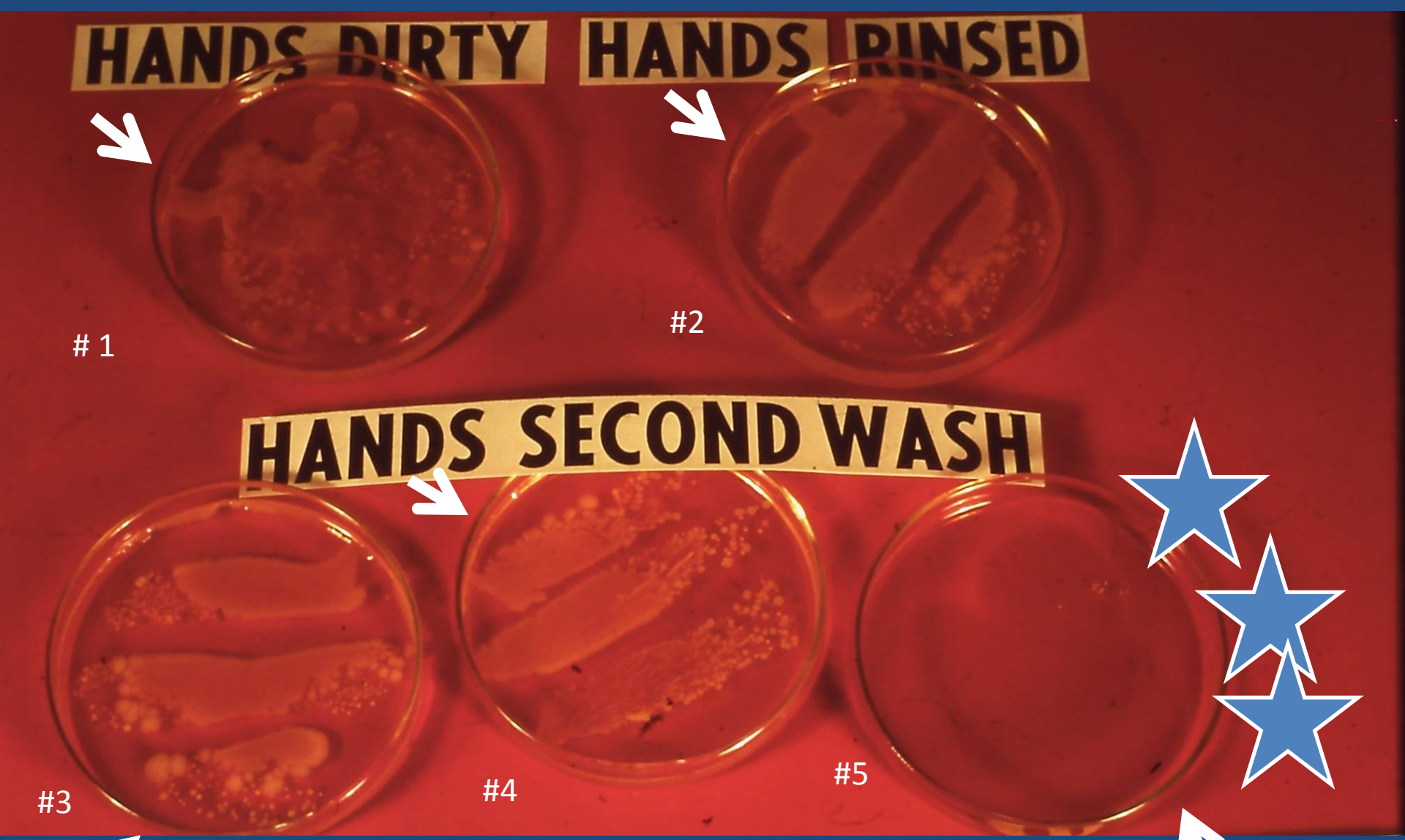
Numbers reduced slightly, but not much


Second wash
this time with
more soap


Hands second wash, improved but still contaminated


Hands now
sanitized

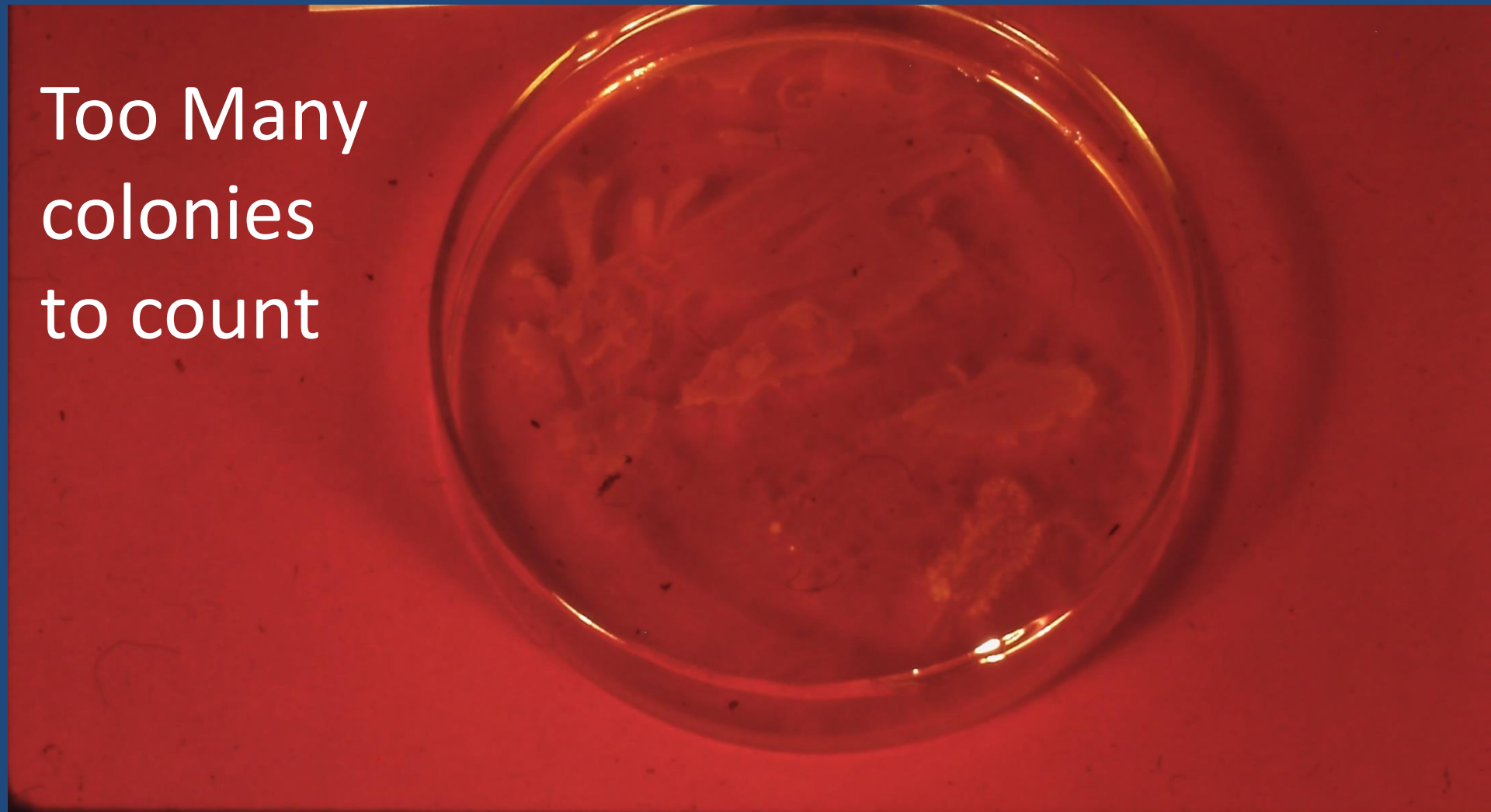
Hands, rinsed, 2 washes and sanitized



Hands first wash Hands sanitized


Dirty
GLOVES

Dirty gloves



Clean


CLEAN GLOVES
Almost sterile

Clean gloves – no contamination

However, upon usage the external will become contaminated

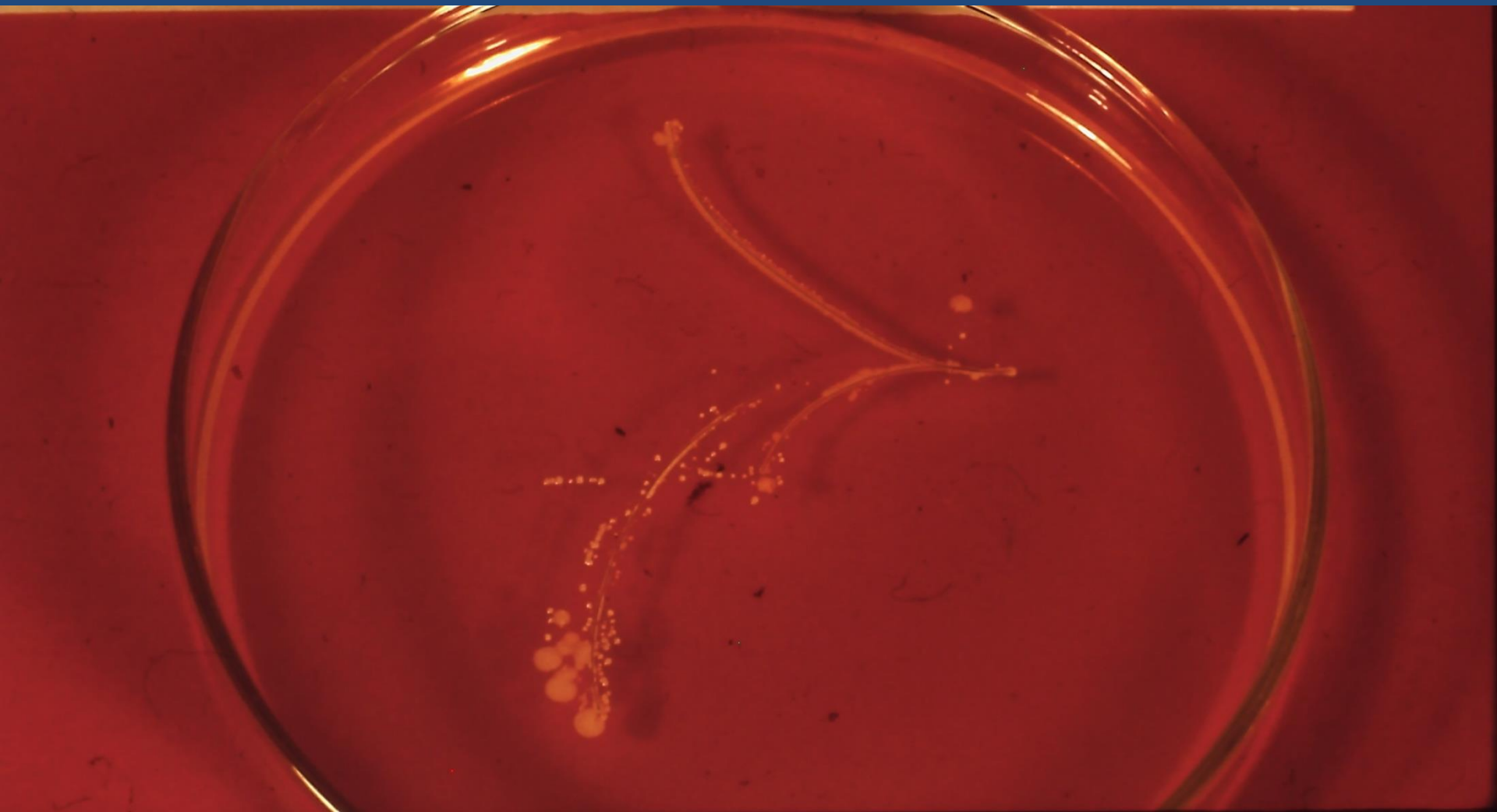

ACHOOOOOOOOOO

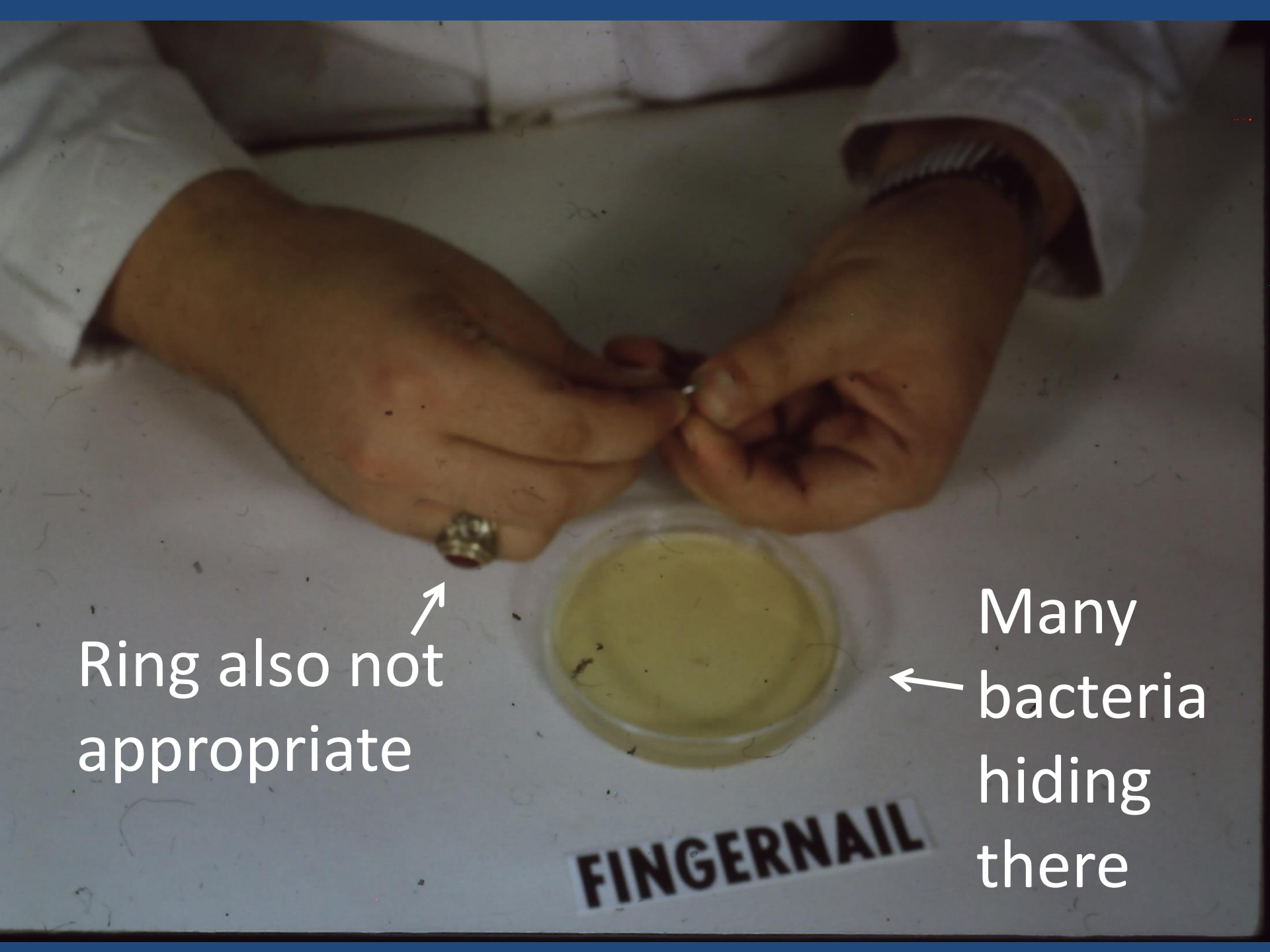
Dirty sneeze

Plate is covered with colonies

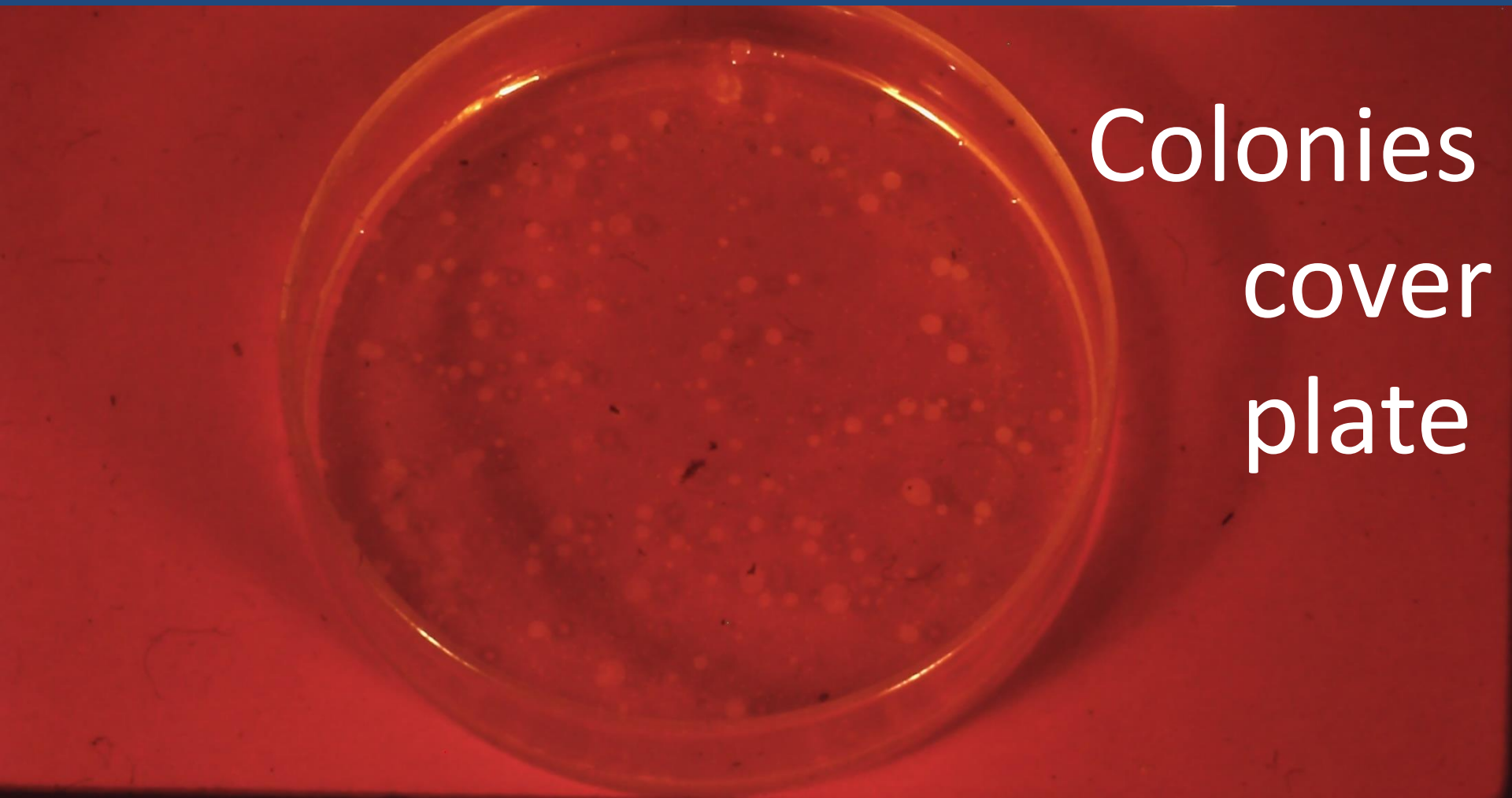
2 Human hairs that was recently washed.

HAIR NET IMPORTANT



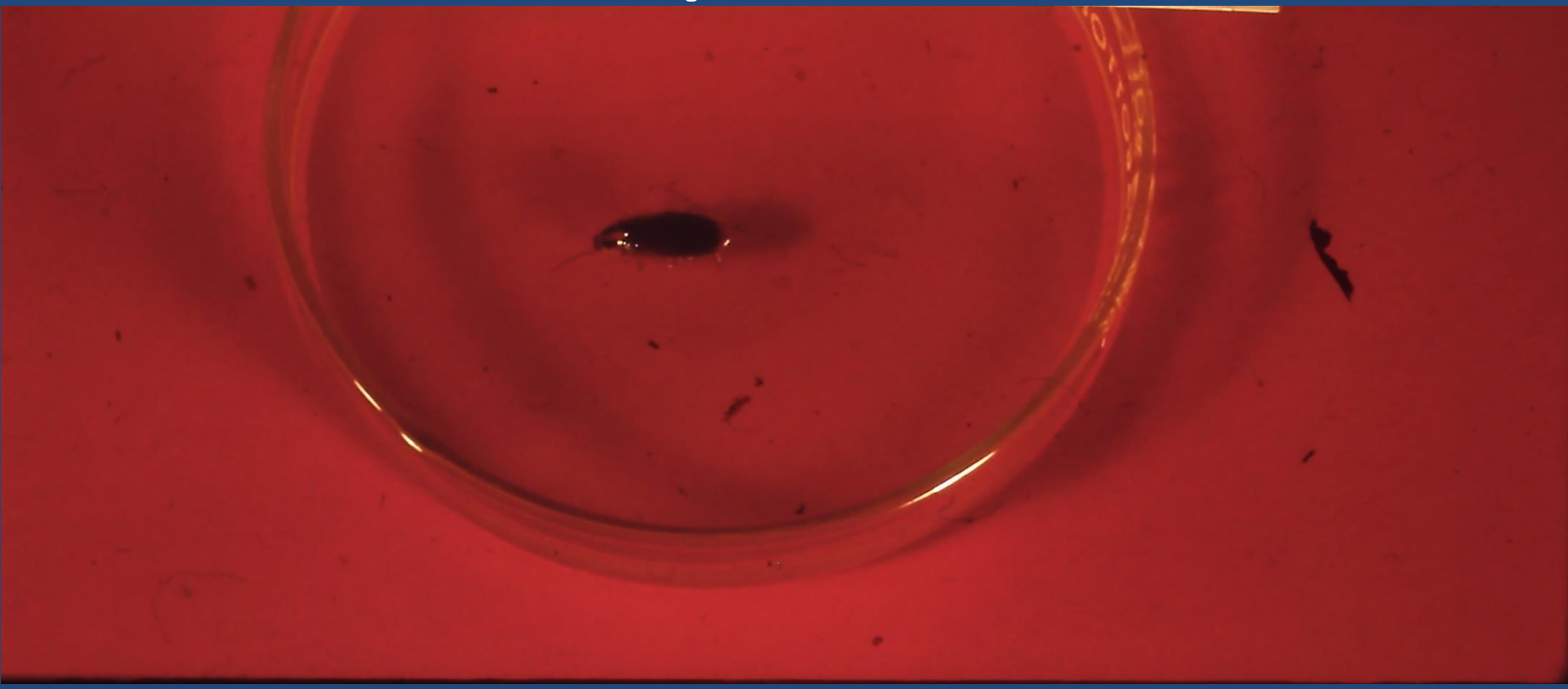

Ring also not appropriate
Many bacteria hiding there
FINGERNAIL

Fingernail



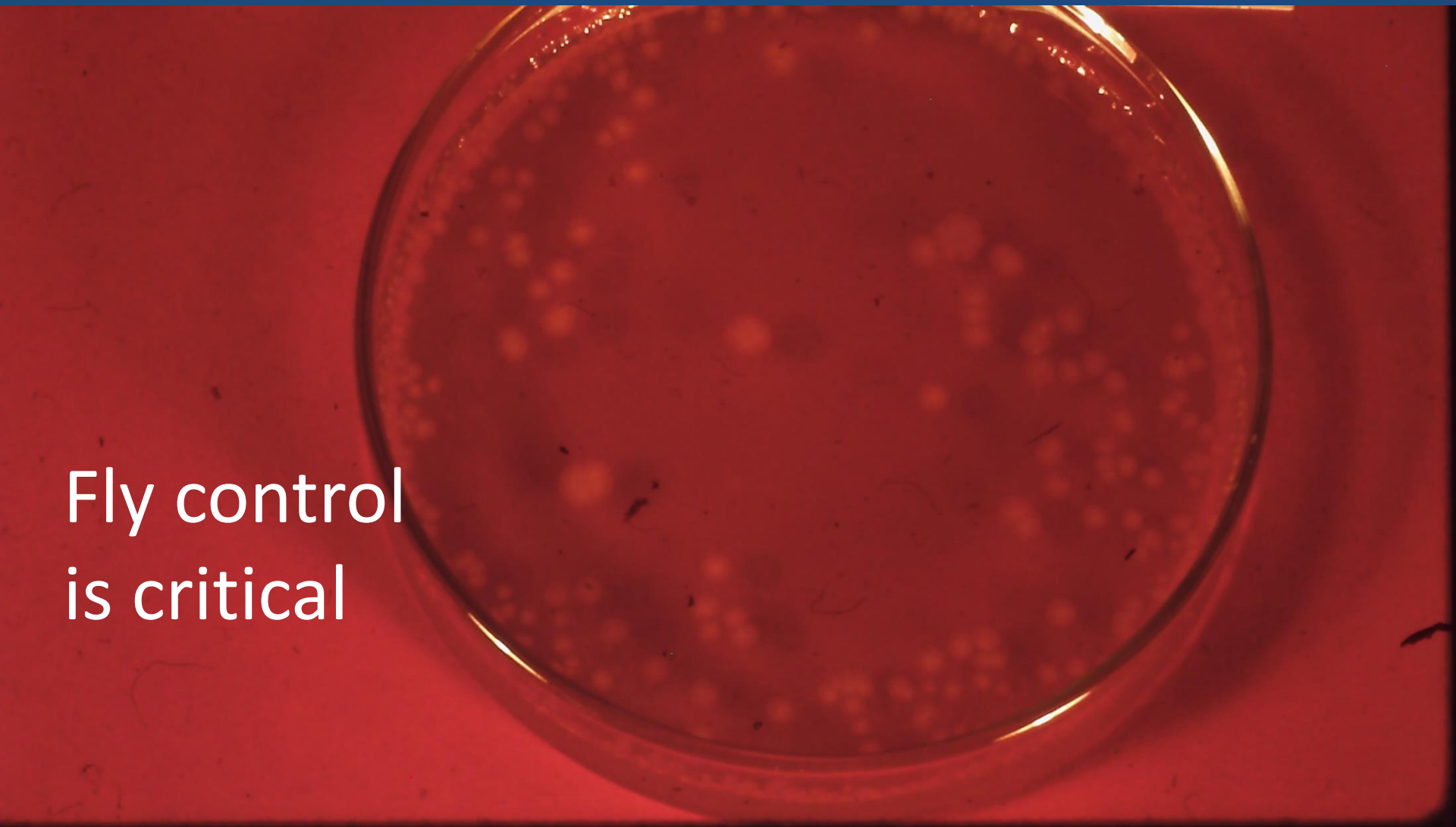
Colonies cover plate

Cockroach strolled across plate



Cockroach Tracks across plate

Fly strolled around plate



SUMMARY

a) Proper housecleaning followed by washing and sanitizing…
b) Keeping equipment cleat at all times which includes frequent clean-up…
c) Personal hygiene is a must…
d) Pest control is extremely essential…
e) Additives can be helpful or a hindrance in maintaining microbiological control…
f) Temperature control is an essential portion of sanitary control…